

THE IRON AGE

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Making Pure Iron Commercially

Initially Made in Tube Form by Electrolytic Method
at Niagara Falls—Wide Scope of
Possible Uses

IRON of such purity that it is difficult to analyze for the metalloids is being produced at the plant of the Niagara Electrolytic Iron Co., Niagara Falls, N. Y. This result is had by depositing the iron upon a steel mandrel through the use of ferrous chloride as an electrolyte and using anodes of blast furnace iron. The tubes so produced, when separated from the mandrel by an ingenious kneading process, may be converted into strips or other forms for commercial use.

This work is being done in the old chemical manufacturing plant of the National Electrolytic Co., which went out of business some time ago. Most of the buildings are either being used or are reserved for future use. A few have been torn down, several were largely remodeled or rebuilt and some new buildings have been put up. The general layout is as shown in the diagram.

The process consists essentially in producing the iron tubes in the cell room shown as Building No. 1 on the diagram; stripping the tubes from the mandrels in the finishing building, No. 5; and regenerating the electrolyte in the tank house, No. 2. Other buildings, used for various subsidiary purposes, will permit large expansion. It is planned to erect at No. 3 a second cell house with two floors. This location formerly housed the shops and storehouse of the chemical company. At present it contains merely the three large steel tanks carrying the reserve supply of ferrous chloride, as shown in the diagram.

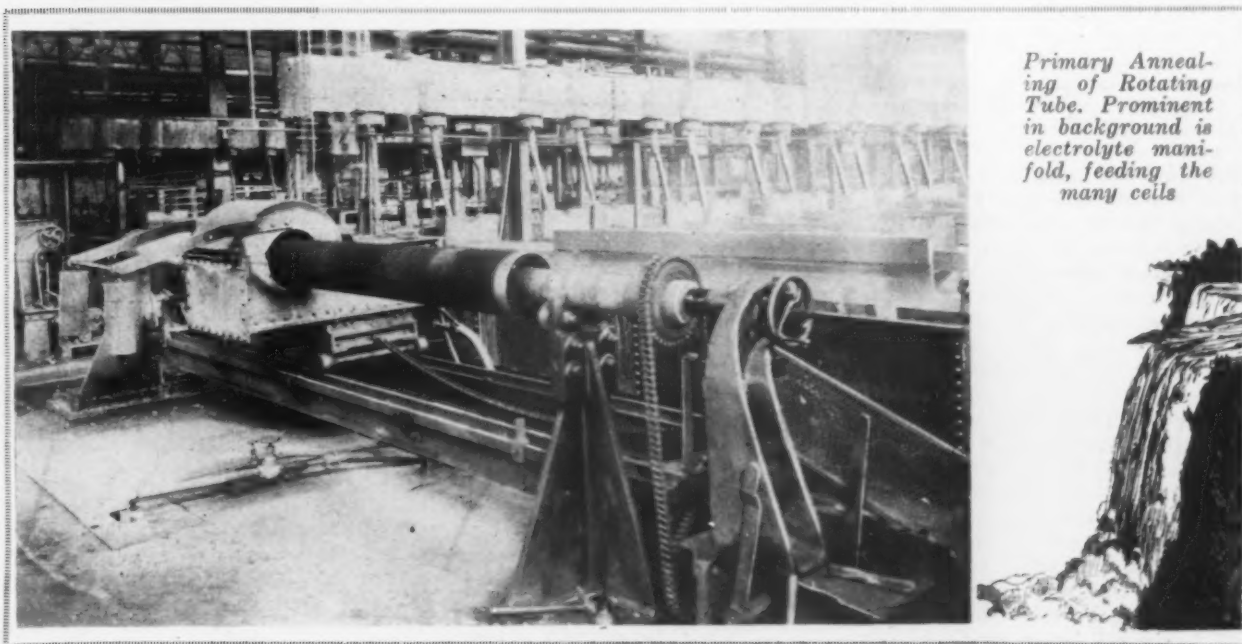
Deep stamping, to a degree not possible with soft

steel without excessive annealing costs, can be performed with this material. It is particularly desirable to be able to do this in connection with the manufacture of certain automobile parts, including hub caps and other pieces. The material will be available for oil cans, cartridges, door knobs, grease cups, vacuum bottles, bottles for ammonia and other gases, disks, such as are used for certain steam turbines, non-corrosive plates for various uses, ferrules, high-grade hinges, metallic hose, toys, electric "ingot iron" and for general deep drawing for a wide variety of purposes. A New England manufacturer has estimated that his own territory can absorb about 22,000 tons per year of materials under the above headings, in addition to which he lists eaves troughs in unlimited quantities.

Uses of Electrolytic Iron

Besides these items the material will form a particularly good basis for making super-heater tubes in competition with charcoal iron tubes. It will be drawn down from the present tubes of about $9\frac{1}{2}$ in. diameter to 6 in. or 4 in. The density of the product, its high heat conductivity, extreme malleability and great resistance to corrosion all favor its use for this purpose. For evaporator tubes to carry alkalis and various salts it is regarded as exceptionally well fitted. Certain forms of steam radiators, it is believed, can be made of the material to advantage.

It has been a serious problem in the laboratory to



Primary Annealing of Rotating Tube. Prominent in background is electrolyte manifold, feeding the many cells

analyze the iron after it is made. Instead of the usual half-gram samples used in regular iron analysis it became customary to use 5-gram samples, because of the minute quantities of metalloids present. This has been extended recently to samples of as much as 20 grams, or 40 times the customary amount, in order that the analysis may be more nearly representative of the fact. To instance what this means, the subjoined table gives the average for a two-weeks' run.

Fe ...	99.966 per cent	Mn ...	0.000 per cent
C ...	0.004 per cent	Pb ...	0.000 per cent
P ...	0.003 per cent	Ni ...	0.000 per cent
Si ...	0.004 per cent	Cu ...	0.017 per cent
S ...	0.006 per cent		

Lead is looked for because it has been customary, in following the French practice upon which this plan was developed, to put a thin lead coating electrolytically upon the outside of each mandrel. Minute quantities of lead thus enter, or may enter, the inner surface of

crete box about 16 ft. long, 2 ft. 3 in. wide and 2 ft. 1½ in. deep, with a wall thickness of approximately 4 in. This cell is deeply impregnated with sulphur, to overcome the natural porosity of concrete. The inner portion of the cell, in which the electrolyte is carried, measures 13 ft. 3 in. long inside. Within this inner portion is rotated at a definite speed a mandrel made of a steel billet, punched and rolled by the Mannesmann process. The mandrel has a diameter of about 9½ in., with a wall thickness of approximately 1½ in., and measures 13 ft. 1½ in. long (4 meters), with bearing ends extending beyond this length.

Process of Manufacture

Within the cell, and to a depth sufficient to submerge the mandrel or anode, is the electrolyte of ferrous chloride (Fe Cl_2). This is kept hot and is in continual circulation from the regenerating station through the cells, down to the pump room and back into the regenerating station. The slight loss through evaporation is very slow and make-up electrolyte has to be furnished at only infrequent intervals. In the bottom of each cell is the anode, in two parts, made of direct blast furnace iron in an open sand casting. Each part has a section approximately quadrant shaped and extending the full length of the cell. It is made in halves for ease of handling. The thickness of metal in the anode is about 3 in.

After the deposition of iron has reached the required thickness—a matter governed by a combination of current density and elapsed time—the mandrel is lifted out of the cell and the iron upon it is subjected to a primary annealing. This is done by passing it at a predetermined rate through a short furnace fired with oil, which brings it to a moderately high temperature. Primary annealing immediately precedes stripping, and there is a certain amount of air cooling between the furnace and the stripping.

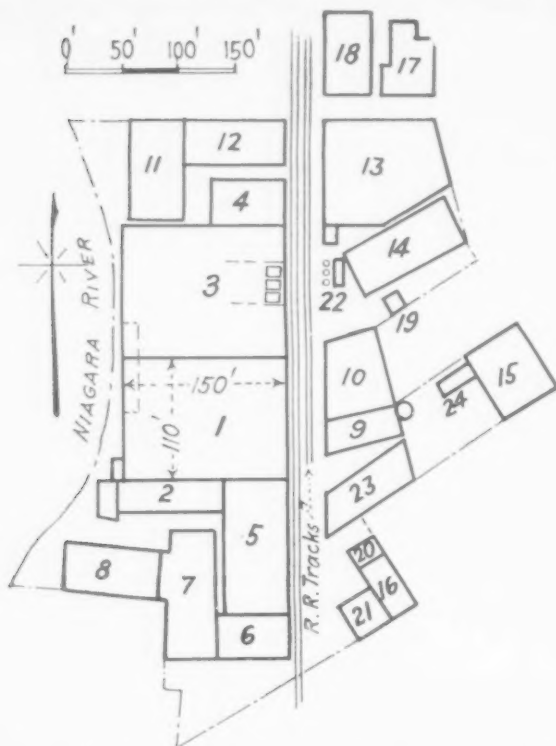
It might be mentioned at this point that the customary run in the cells, for thicknesses now generally used, ranges from 25 to 40 hr. With the current density here employed it takes about 31 hr. to deposit a thickness of 0.1 in. of iron upon the mandrel. The electric leads into the building are operated at about 170 volts d.c. As this voltage is impressed in series upon the entire battery of cells, it follows that each cell produces a resistance which is overcome by a pressure of about five volts.

Separating Tube from Mandrel

French design is responsible almost wholly for the stripping machine, which the mandrel and its deposited iron reach by means of an appropriate electric truck, immediately after the primary annealing. Essentially, the machine is a means for rotating the mandrel at definite speed, while at the same time subjecting it to the cold rolling action of three rollers, 120 deg. apart, each pressed radially against it by its own hydraulic cylinder. These rollers are mounted on a carriage which traverses the bed of the machine, thus providing a spiral rolling action from one end of the tube to the other.

In the process of stripping it has been found imperative to work upon the central portion of the tube first, leaving about 6 or 8 in. at each end untouched by the rollers. This is based upon the fact that the roller action expands the metal and, if the ends were loosened first, the expansion would take place longitudinally and it would be difficult to strip the tube from the mandrel. By leaving the two ends fixed and stripping the inner portion first, the expansion becomes circumferential and an increase in diameter of as much as 1/16 in. is effected.

After the central portion is thus stripped, the ends are handled in the same manner, when an elongation of the tube of ½ in. to 1½ in., with an average of perhaps ¾ in. to 1 in., is found to have occurred. The action is that of moving rolls outside the tube, with a fixed roll inside, that is, fixed with regard to the tube itself. Separation of the tube from the roll is indicated by a sharp succession of cracking noises, sounding much like the staccato rattle of a machine gun.



Block Plan of the Plant, Which Stands at Top of Cliff Overlooking Niagara River and Is a Few Hundred Yards Below the International Bridge

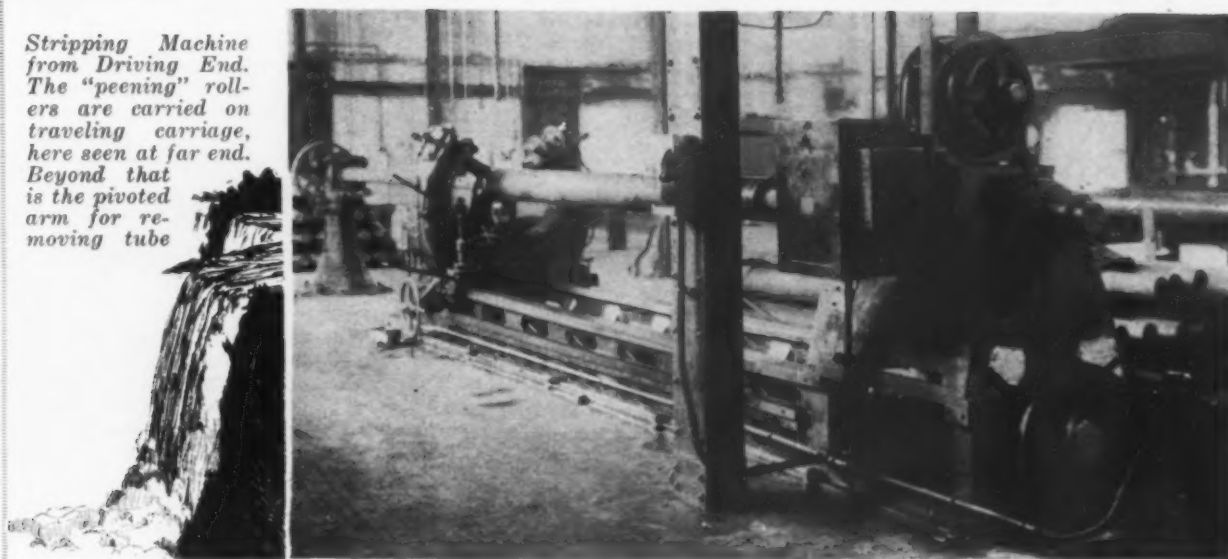
- | | |
|-----------------------|-----------------------------|
| 1—Cell House | 13—Storage and Machine Shop |
| 2—Tank House | 17—Office |
| 3—Cell House (future) | 18—Rotary Station |
| 4—Tank House (future) | 19—Time Office |
| 5—Finishing Building | 20—Yard Office |
| 6—Unloading Shed | 21—Locker House |
| 8—Pyrites Building | 22—Switch House |
| 11—Boiler House | 23—Storage |
| 12—Coal Storage | 24—Oil Storage |

the tube, and sometimes can be found in the analyses. It is now becoming the practice at this plant to use the lead mandrels only occasionally, as a check on the other system, and to use in general practice mandrels with a light grease coating, instead. The fact that the grease coating applies to more than nine-tenths of the cases, at present, explains the absence of lead in the above analysis.

Copper enters through the practical inability to get rid entirely of copper scrap from the scrap, bought in the open market, and used in the regenerative process. Machine shop turnings constitute the principal scrap purchased. Fine particles of brass, and sometimes of copper or bronze, are found in the scrap, and once in a while a good-sized chunk makes its appearance. These larger pieces may be recognized and eliminated, but sometimes even these escape because, if covered with grease or dirt, it is impossible to detect them as differing from the steel used for the process.

In the cell house are four batteries of 35 cells each, one battery being now in operation. Each cell is a con-

Stripping Machine from Driving End. The "peening" rollers are carried on traveling carriage, here seen at far end. Beyond that is the pivoted arm for removing tube



When thus separated from the mandrel, the tube is slid off onto a swinging arm centered with the end of the mandrel, and then is carried from that arm to the weighing scales. Removal to the swinging arm necessitates supporting the end of the mandrel by the centering pin in the end of the arm and withdrawing, from below the mandrel, the support used during stripping. This support consists of rollers operating in roller bearings, and carried by a member which may be lowered into its housing to clear the end of the mandrel.

As delivered from the stripper the tube is hard and brittle—so hard, in fact, that it is difficult to cut off a section as a sample or for analysis. This condition is overcome by passing it through an electric furnace, giving it the final annealing treatment. The furnace, served by General Electric nichrome resistance elements, is carried at about 1600 deg. Fahr. The tube passes through it in continuous slow motion, which requires approximately 15 min. from entrance to exit. The tube moves on rollers operated by rope drive from a motor, with appropriate gearing, having reached these rollers through an automatic table which delivers each tube to the rollers just a few inches from the rear end of the one next preceding. Delivered side-

wise onto the roller table, the tube goes lengthwise through the furnace.

Coming out of the furnace, the tube passes through a ring of water spray, consisting of a pipe with 1/16 in. holes at about 1-in. intervals, which completely encircles it. The spray loosens all the scale outside and inside. No tempering of the metal occurs, due to the practical freedom from carbon. The amount of scale thus obtained is only a few pounds per week. The tubes go from the annealing furnace to the second and third floors of the same building, which constitute the tube storage.

On the second floor a slitting machine is about to be installed which, cutting a radial line, will slit the tube automatically into strips ranging from 1 in. or less up to 12 in. in width, while a second portion of the machine coils these strips for shipment. In this form the material is ready for use in cold rolling or in stamping or other processes to which it is ultimately to be put.

Examples of Tests

Some of this metal, with a thickness of 0.1 in., was cut into a strip 0.132 in. wide, rolled into a round with a diameter of 0.09 in., and then drawn down by suc-



Electrolyte Regenerating Tanks in the Tank House. There is a battery of tanks for each of the four batteries of cells



cessive stages to 0.035 in. diameter without intermediate annealing. This reduction of 85 per cent in sectional area was made without distortion of the metal, as will be indicated by the following summary of tests made on portions cut off at intermediate stages:

Tests of Wire Drawn from Electrolytic Iron

Diameter of Wire	Elongation in 6 in.	Tensile Strength, Lb. per Sq. In.
0.090 in.	1.16 in.	44,018
0.065	0.08	67,807
0.050	---	70,791
0.044	0.06	82,210
0.035	0.06	100,820

In another case a strip was drawn down for making shot gun shells. This originally had a thickness of 0.058 in. It was annealed and then was given seven successive passes before the next annealing, bringing the thickness down to 0.012 in., or a reduction of 79 per cent. After the second anneal, the strip was given three more passes to a final thickness of 0.0085 in. This passed the regulation shop test for such metal and was labeled "o. k.—hard."

The principal point in connection with treatment of this sort lies in the fact that an unusual number of drafts may be made between anneals. This saves the cost and extra time and labor required for annealing and at the same time relieves the annealing furnaces of a large amount of work, thus caring for a heavy tonnage with a minimum amount of annealing equipment.

In a test made of some of the French iron produced on the same principle an unusual result was obtained after the formation of a bottle for carrying gases. The end of the original tube was drawn in until it was closed (with the use of a red heat), after which the end was shoved in as shown at B in the diagram, where A was the original form. The tube was then subjected to an excessive internal pressure, by means of a compressor, resulting in blowing the end of the tube out again (C) into a form similar to the original as manufactured. As will be noted, the material was bent back in the cold distortion and then blown out flat again by the applied pressure, but no cracks or tearing developed at the point where this double flexure took place.

Continuous Circuit of Electrolyte

After passing through the electrolytic bath, the electrolyte is delivered to tanks in the basement, from which it is pumped up into the regenerator room. Great difficulty was at first experienced with the pumps used for this purpose, as the ferrous chloride attacked the metal and rapidly ate it away. Eventually recourse was had to pumps in which the running parts and parts

exposed to the liquid were made of duriron. Much longer life is thus obtained.

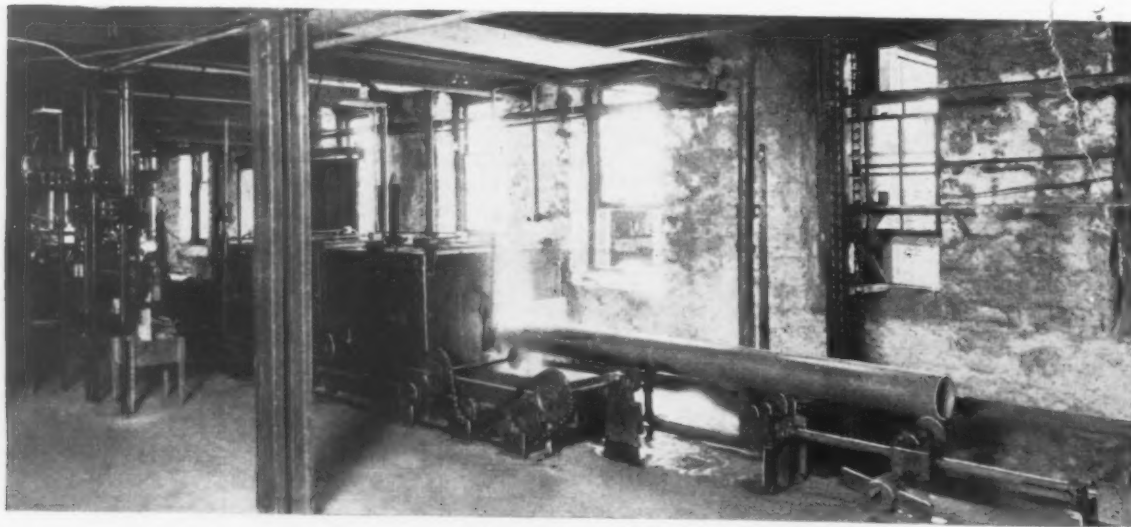
In the regenerating station is a series of vertical tanks, one battery to each battery of cells. The electrolyte passes into these tanks, where it comes in contact with a certain amount of steel scrap, and compressed air is blown in. At the same time steam is supplied to provide the required temperature. Thus there is a continuous circulation of the electrolyte from the cells, through the regenerator tanks and back into the system, where it passes through a manifold and thus, by individual pipes, down to each cell. The regenerating tanks are lined with concrete, to prevent eating away of their steel shells.

Two subsidiary operations consist in impregnating the cells with sulphur and transforming the electric current from high-tension, alternating, to low-voltage, direct current. The sub-station contains two rotary transformers of 1750 kw. each, two of 500 kw. and one of 300 kw. All of these will be needed when the entire plant, with present contemplated expansion, is in operation. Just now, however, one of the 500-kw. units is all that is required. Current comes into the plant at 12,000 volts and passes through outdoor oil-cooled transformers in the three phases. From the transformers current is tapped off at 220 volts for plant operation and 110 volts for the lighting circuits. Other transformers convert 12,000-volt alternating current to a voltage suitable for the rotary converters, which deliver direct current at 160 to 260 volts, as desired, to the cell house.

Impregnating of the concrete cells is an art in itself. The concrete is cast in the usual way and allowed to age for 30 to 40 days. It then is immersed in a bath of molten sulphur at a temperature of 260 to 320 deg. Fahr. for enough time to obtain the depth of penetration required. This time varies with the density of the original concrete and is determined by breaking open, at intervals, small test pieces of the same mix of concrete, which are immersed in the bath at the same time as the cell. The bath has capacity for two cells at once. A penetration of about 1 in. should be enough to render the concrete practically impermeable by the electrolyte.

Process Comes from France

At Grenoble, on the French side of the Alps, is a plant which has been operating for a number of years on the scheme just described. This has formed the genesis of the American system now under way at Niagara. Not only is the operation the same at Niagara as in the French plant, but nearly all of the



Tube Emerging from the Electric Annealing Oven. A ring of water spray meets it, causing the steam shown. When the tube reaches the end of its run its weight trips the roller table and drops it upon the carrier in background, which takes it to an upper story, automatically discharging it at either second or third floor, as required



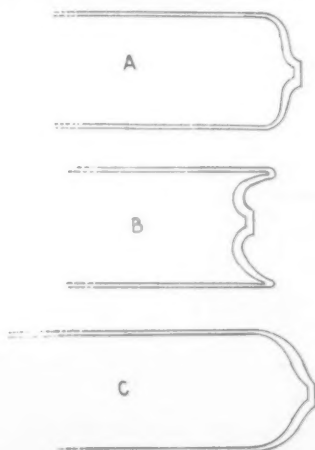
Concrete Tanks Deeply Impregnated with Sulphur Are Used to Carry the Mandrels in the Bath of Electrolyte. In circle is shown the tank construction at driving end. The mandrel rests on a bearing at the inner partition, while the electrolyte runs over into the little outer compartment, whence it is drained and put back into the system, which is one of continuous circulation



equipment is based upon French design. The stripping machine was brought from France and only a few changes have been made in it here.

At the same time, however, American methods are being put to work at Niagara. Prominent among these are the larger scale of operations, the increased size of mandrel (the French mandrels are about 6 in. in diameter) and the departure from the use of lead to the use of grease as a separating film between mandrel and deposited metal. While at present the products of the two plants are identical in characteristics, it is be-

Bottle Made from Electrolytic Iron, with End as A, was Forced Back Cold as at B and Then Expanded by High Internal Pressure to C, Without Rupture at Bends



lieved that the development of the next year or two at Niagara will provide elements of superiority over the French product which, of course, cannot now be estimated. In any case, however, this plant, operating on a much larger scale than that in France, should carry a heavier weight in world markets.

Indeed, it is the expectation that, with the present and immediately future plant here, the capacity will be about 7 tons of finished material per day, compared with 2 tons at the Grenoble plant and with not more than 4 tons at other plants.

Iron and steel workers in July, at 206 establishments, numbered 266,108, compared with 270,260 in June, according to a compilation of the Bureau of Labor Statistics. The reduction was 1.5 per cent, but there was an increase of 10.9 per cent from a year ago. Payroll in one week in July, at this same establishment, amounted to \$7,425,540, a reduction of 6.6 per cent from the \$7,948,157 of a week in June. Individual pay envelopes fell off by more than 5 per cent. Total payroll increased 24.5 per cent over a year ago.

Multiple Packing System for Bolts and Nuts

WASHINGTON, Sept. 1.—The multiple packing system proposed for merchandising bolts, nuts and rivets, as pointed out in detail in THE IRON AGE of Aug. 20, page 468, will eliminate much handling for jobber and dealer, particularly when it is possible to order a single size to the case, whether the small case or larger size. This is pointed out in a second statement just issued by the Division of Simplified Practice which explains, as THE IRON AGE article did, the advantages that will result from the sale of bolts, nuts and rivets by the package or weight instead of the decimal count.

"As to the need of purchasing by count," says the statement, "it is declared that the present practice merely guides the consumer in purchasing the nearest number to his needs. If he needs 987 bolts, he orders 1000 because it is the nearest unit of measurement. With the multiple system of packing, it is pointed out, the customer can order the nearest number by carton or case, . . . and accomplish the same end."

Life of Coal and Ore Screens

The life of punched screen plate used in sizing coal at the mine is variable and indefinite, according to the Bureau of Mines, Department of Commerce. Some plate screens have been discarded as worn out in as little as two years. Others have been discarded because the holes had become elongated and no longer permitted close enough sizing. Some screens lack adequate support and the screen plate sags until the coal no longer spreads out on it. The knockers used to keep the perforations open occasionally wear holes through the plate of screens used for the small sizes. In other plants screen plates have been in constant use for five or six years. Coal is not severely abrasive and the plate seldom if ever wears through.

Surfaces of ore screens wear much faster and in some plants their life is measured by a few weeks or days or by a relatively small number of tons of material handled, especially when they are used to screen the harder ores to produce the smaller sizes. A wear of, say, 1/32 in., damages a small hole more seriously than a large hole, as the proportionate increase of the opening is much greater. The closeness of sizing required may determine the life of such screens. Wet material abrades screens more than dry material. Small screens sometimes become permanently blinded and are discarded.

Iron Ore from Northern Spain

Supplies of Vizcaya Province—Their Character, Manner of Working and Extent— Labor Conditions

BY LUIS BARREIRO*

VIZCAYA is the richest province in iron ore of all of Spain, and is situated in the north, between the provinces of Santander, Burgos, Alava and Guipuzcoa. This province, with Alava and Guipuzcoa, forms the Basque country, where a different language from the Spanish is spoken. The race and customs are also different and the Spanish Government has granted this country certain privileges to administer the municipal and provincial interests. The capital of the province is Bilbao, situated by the sea in the Bay of Vizcaya. The province has an area of 2198 sq. km. (850 sq. mi.)

It is not known when the first discovery of iron ore was made in this province, but there are signs that iron ore was smelted in the mountains with charcoal about the seventeenth century, using water power for the movement of the old and primitive machinery employed to make iron utensils for agricultural implements. The export of the ore dates from 1860.

Geology

The district may be divided into two groups of mines, that of Somorrostro and that of Bilbao. The Somorrostro group includes the most important deposits of the province, those of Triano, Matamoros and Galdames. The Bilbao group contains the mines of

Morro, Miravilla, Ollargan and Iturrigorri. These mines are around the city of Bilbao, some of them inside the city boundary, and for this reason the excessive cost of the ground where dwelling houses are erected make the working impossible.

The rocks that form the stratification of nearly the whole of the province are of the Cretaceous period (upper and lower), with frequent outcrops of volcanic rocks in the neighborhood of Bilbao. An extensive stretch of lower cretaceous rock traverses the center of the province from northwest to southeast. These rocks present an anticlinal fold.

The greater part of the ore masses lie on the Cenomanian beds of micaceous sandstones, while they often are covered by calcareous shale, which again is above the compact limestone, so that generally the ore occupies the place of the latter, with which it is often intimately connected. This is more particularly to be observed in the Campanil deposits. The ore masses occur mostly in the form of beds and pockets and follow the configuration of the limestones and sandstones in which they lie. At places they appear like veins, from the effects of faults and dislocations in the strata.

The mode of occurrence of these ores and their relation to one another and to the limestone beds point to their formation by hydrothermal action. Springs charged with ferrous carbonate, dissolved by reason of an excess of carbonic acid, operated on the lime-

*General manager Morro Mining Co., Bilbao, Spain.



Above Is Shown the Way Cars of Ore Are Carried from Pit or Working Face of the Mine to Treatment Plant by Means of a Double Track Railway Operated by an Endless Chain

Typical of the Landscape Is the Village-and-Workings View Below. Tile roofs predominate in the plant, which is of modern construction



General View (at Left) of Aerial Ropeway Handling Ore Up-Hill and Down-Dale. This shows the rugged character of the terrain



stone beds; and, as the carbonate of lime is more soluble in water saturated with carbonic acid than the ferrous carbonate, it has been replaced by the latter, which in its turn has been transformed into red or brown hematite by a subsequent loss of carbonic acid and absorption of oxygen.

Classes of Ore

There are four classes of iron ore in this district, as follows:

1.—Vena—Red Hematite—Soft, purple, compact and often powdery.

Vena is generally the purest of the Vizcayan ores and was formerly used in the old forges of the country.

2.—Campanil—Red Hematite—Compact and crystalline and often accompanied by rhombohedrons of carbonate of lime.

Campanil was the first ore worked when the discovery of the Bessemer process gave a great impetus to the mining industry of the province. It is now nearly exhausted.

3.—Rubio—Brown Hematite (Limonite)—Hydrated ferroxide brown streak, its principal gangue siliceous.

Rubio appears frequently in cellular and concretioned forms, and generally mixed with clay and siliceous matter, and it is found in contact with backs of clay, limestone and sandstone.

4.—Carbonato—Spathic ore (Siderite)—Gray, granular and siliceous; and creamy white, laminated and crystalline.

Spathic or Carbonato ore appears sometimes in small quantities enveloped in lumps of rubio; it forms pockets in the midst of other ores and generally is found below them.

Mining Methods

Mining of the ore in this district is still done with very primitive tools, as picks and shovels, hand drill and baskets and wheelbarrows. However, during the last few years there are several mechanical shovels and drills. Most of the mines are operated in open pits, the overburden is stripped off and taken to some place far away from the concession.

The reason mechanical appliances have not been in use until lately is that wages were low and no machine could compete with the hand labor, but since the European war the wages have increased over 100 per cent and therefore now machines can compete with the men's labor.

When underground working is required, owing to the excessive cost of taking away the overburden, shafts are sunk and the ore is hoisted in baskets by a handwinch and carted from the mouth of the pit to the deposit in horse-drawn wagons.

The rail lines used inside the mines for transport are of 0.65, 0.75 and 1 meter (25% in., 29½ in. and 39% in. gage). The wagons have a capacity between

Analysis of Ores.—The approximate analysis of the four classes of ore is as follows:

	Vena	Campanil	Rubio		Carbonato	
			First Class	Second Class	First Class	Second Class
Metallic iron	56.80	52.74	54.95	51.06	41.47	38.78
Manganese	0.84	1.33	0.56	0.49	0.93	0.69
Lime	1.31	5.53	0.85	0.50	1.70	1.56
Silica	6.21	5.30	7.12	9.75	6.59	8.99
Phosphorus	0.015	0.010	0.013	0.024	0.017	0.019
Sulphur	0.016	0.014	0.025	0.040	0.14	0.27
Moisture	8.15	7.47	6.10	6.10	1.62	1.95

1 and 2 cu. m. (35 to 70 cu. ft.) and are drawn by horses. There are some steam locomotives and a few petrol (gasoline) engines.

Blasting is required in most of the mines. Holes are made by hand, although there are now drillers. Drills are also used to break down the ore after blasting. To classify or separate the ore, the hammer, the spade, the rake and the basket are employed.

Calcination. As the spathic ore could not be used in the raw state it was necessary to calcine it in kilns. There are several kiln installations in the district, where the ore is roasted and the new product, which is richer in iron, although higher in sulphur, finds a ready sale. However, since the war, the demand for this kind of calcined ore has been very much reduced.



One of the Inclined Planes for Handling Ore Cars Appears at Left

Below is a Bucyrus steam shovel at work on an open cutting



This Gantry Crane Is Used to Unload Ore Buckets from Two Aerial Ropeways and Distribute It on the Storage Pile



Washing. At the beginning of the working of the mines, only the lumpy ore was used; the small was thrown in big piles, which in some places have been converted into mountains. During the last 20 years washing plants have been erected to wash this rubbish, from which a good ore is separated. The ore is washed in log-washers or trommels.

Transport. The ore is transported from the mines to the tips by narrow gage lines, endless chains, aerial ropeways and broad gage lines. The longest distance is about 14 miles. The Orconera Iron Ore Co., Ltd., an English company which owns the best iron deposits in the district, has an aerial ropeway 5 miles long which conveys the ore from the mines to the washeries situated by the sea, and bring the washed ore back to be sent by rail to the tip.

Power. All the power used in the mines is electric. The current is obtained from various generating stations worked by water. There are two or three mines which have water power in the same grounds and after the fall the same water is used for the washeries.

Electricity is used to move the ropeways, inclined planes, drills, endless chains, mechanical shovels, etc. The cost of the kilowatt-hour is from 0.15 to 0.30 pta. (2.2c. to 4.35c. at 14.5c., or 2.9c. to 5.8c. at par.)

Owing to the increase of wages some more shovels or excavators are being introduced in the mines here. The principal machines used are American, Thew and Bucyrus.

Personnel Matters

Wages. The minimum wages which now are paid to men are as follows:

	Ptas. a Day	At Current Exchange
Boys under 16 years.....	4.90	or \$0.71
Boys under 18 years.....	5.50	or 0.80
Men over 18 years.....	7.00	or 1.02
Men who work underground or drillers.....	8.00	or 1.16

and generally they all get a little over these wages, but, according to the different agreements the minimum wages to be paid are these.

Hours. Since Oct. 1, 1919, according to the Act of April 3, 1919, the maximum number of working hours is 8 per day or 48 weekly. The hours are: Morning, from 8 to 12; afternoon (winter) from 1 to 5; (summer) from 2 to 6 p. m.

Workmen. The number employed in the mines is as follows:

	Vizcaya	Spain	Vizcaya Percentage
1913.....	12,000	122,775	10
1925.....	6,500	93,000	7

Production per man. Although it is not possible to state definitely the daily output per man, as it varies according to different mines, it may be said that the average is a ton of ore per man per day.

Workmen's Compensation. The new Act of 1922 established that in case of accident the workman will get daily (including Sundays) three-quarters of his wage while he is under treatment. Should the accident prevent him from occupying another post in any other trade, he is entitled to a sum equal to the wages of two years. If he can work in another trade, he is entitled to the wages of 18 months. In case of death, his family is entitled to the wages of two years, plus the funeral expenses.

Old Age Pension Insurance. Under this insurance, in force since July, 1921, the employer is obliged to pay 10 centimos a day per man, or 3 pesetas per month. After the man reaches the age of 65 years, he gets 1 pta. a day.

Cost of Production. The following details are approximate and give an idea of the cost of production per ton of ore:

	Rubio Ptas	Washed Ptas	Spathic Ptas
Wages.....	6.50	8.00	10.00
Mechanical preparation.....		2.00	
Explosives.....	0.66		0.82
Coal.....			4.00
Electric power.....	0.30	0.30	0.30
Materials.....	0.50	0.50	0.50
Taxes.....	1.25	1.25	1.25
Management and general expenses.....	1.00	1.00	1.00
Total.....	10.21	14.05	17.87
Equivalent at current exchange.....	\$1.51	\$2.14	\$2.59

Production, Consumption and Exports

Production of Iron Ore. The following are the official figures.

(Metric Tons)

	Vizcaya	Spain
1913.....	3,864,595	9,861,668
1914.....	2,618,149	6,819,964
1915.....	2,674,638	5,617,839
1916.....	2,815,974	5,596,861
1917.....	2,464,894	5,551,071
1918.....	2,585,793	4,693,651
1919.....	2,542,307	4,640,061
1920.....	2,568,590	4,767,693
1921.....	1,211,450	2,602,369
1922.....	1,216,388	2,771,888
1923.....	1,642,692	3,453,233
1924.....	2,436,423	4,000,000

National Consumption. During the last few years it is estimated that about 1,000,000 tons of ore is consumed in the ironworks of Spain, and about 75 per cent of that amount is consumed in the ironworks of Vizcaya.

Exports of Iron Ore. The figures of the exports are similar to those of the production. However I should like to point out that in 1899 about 5,500,000 tons of iron ore was exported from the province of Vizcaya. Before the war about 75 per cent of the exports were for Great Britain and since then 95 per cent. During the war no ore was sent to Germany and now very small quantities are sent to that country. Some odd cargoes of iron ore have been dispatched to the United States.

Since 1860 about 175 million tons of iron ore have been exported from the province of Vizcaya, through the port of Bilbao. This port is the mouth of the River Nervion, where nine iron ore loading tips are situated, belonging to railroad companies and private mining companies.

Reserves. The actual reserves of iron ore in the district are estimated at about 70 or 80 million tons. The total reserves of Spain are calculated at 900 million tons of ore, which contains between 45 and 60 per cent of iron. In the center of Spain are large deposits of ore of good quality, but the excessive cost of transport prevents their working.

Spain stands fifth in the list of European countries in size of its iron ore reserves, and is next to Sweden.

Numerous Taxes

There are different taxes and duties which must be borne by the ore, as follows:

Concession Tax or Royalty. Every hectare (2.47 acres) of ground obtained as a mining concession must pay to the State an annual tax of 6 ptas.

3 Per Cent Tax. The State, when granting permission or concession, reserves the right to 3 tons of ore from every 100. This tax is based on the value of the ore at the mine after extraction, before being transported.

Export Customs Duty. Exporters pay a duty of 0.20 pta. (gold) for every ton of ore which leaves the country.

Port Tax. The Port authorities charge 1 pta. for every ton exported, but this tax is always paid by the ship.

Transport Tax. The State charges another 1 pta for every ton exported, which, also is paid by the ship.

Maritime Traffic Tax. The ship pays another tax of 0.35 pta. for every ton exported. This tax arose from the losses sustained by the national ships which were requisitioned by the State during the war and to compensate this loss this tax was levied.

Dividend Tax. The dividends distributed to shareholders pay to the State a tax based on the interest rate which the dividend represents.

Profits Tax. This tax is also based on the interest, which represents profit, and it is charged although no dividend is distributed.

Stamp Duty. The share or stock certificates must pay a yearly duty of 1.50 per cent on the actual value.

The new municipal act authorizes the city councils to charge another tax on the iron ore.

Position of the Iron Ore Trade

The figures given above of the production will give an idea of the depressed state of this staple industry.

There are several causes for this, which may be summarized as follows: Low consumption of iron ore, high cost of production, and competition of the ores from Algiers and North of Africa and from Wabana. England is the only consumer of Spanish ores and, as at present the number of furnaces in blast is low, the ore necessities are small.

A national mining conference was held in April in Madrid, to study the crisis of the mining industry, and several resolutions were adopted to help this trade. A resolution was adopted, also, to present to the Government a new mining code, as the laws now ruling are old. [This refers probably to obsolescence, making them unfitted for present conditions.]

Using Ohio River for Steel Shipment

CINCINNATI, Sept. 8.—Operation of a barge line on the Ohio and Mississippi rivers from Ironton, Ohio, to Memphis, Tenn., for the transportation of pig iron and wire nails, mentioned on page 619 of last week's issue, will be started soon by the Indiana-Belfont Transportation Co., Ironton, Ohio, which has been incorporated with a capital of \$200,000. The company is an alliance of the Belfont Steel & Wire Co., Ironton, Ohio, and the Indiana Flooring Co., New York. I. P. Blanton, president of the former, is head of the new company, while G. W. Van Brieman, president the Indiana Flooring Co., is secretary and treasurer.

Orders have been placed with the Marietta Mfg.

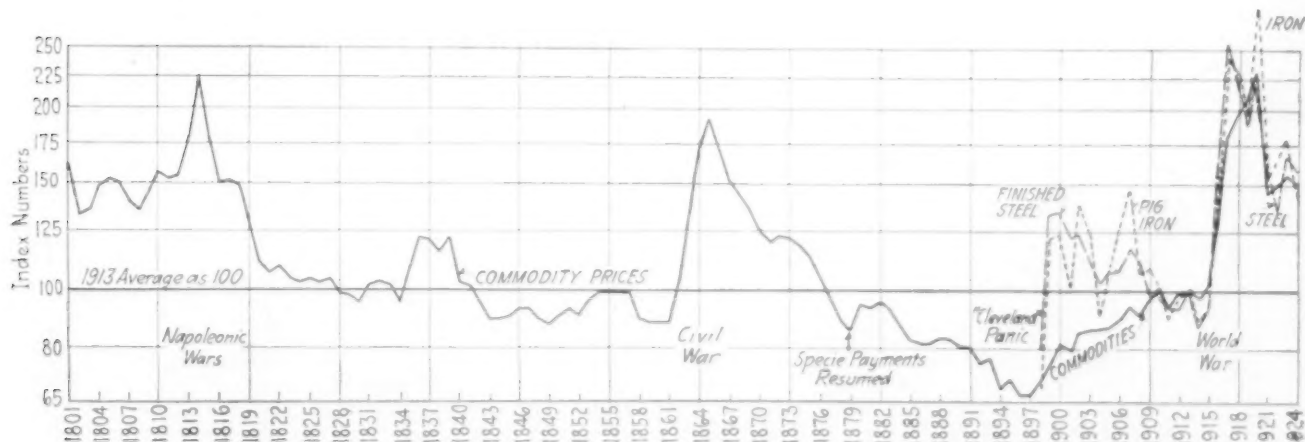
Co., Point Pleasant, Ohio, for the first towboat, which will be of steel construction. It will be an oil-burner equipped with a Diesel engine. Six steel barges, each of 1000 tons capacity, are being built. Pig iron and nails will be carried from Ironton to Memphis and hardwood lumber will make up the cargo on the return trips.

A chartered boat and barges will begin the first voyage on Oct. 1, as the company's equipment will not be ready for several months. Ultimately it is expected to have several steel hull boats and 15 barges in operation with semi-monthly trips scheduled. The steel barges are to be so constructed that they can be operated with the aid of unloading conveyors of various kinds.

Prices for a Century and a Quarter

IN the diagram is traced a curve of wholesale commodity price indexes from 1801 to 1924 inclusive, based on figures recently published by the United States Bureau of Labor Statistics. The indexes are related to the average of 1913 at 100. Naturally there have been many changes in the list of commodities over the period of more than 120 years, but each successive period has had comparable figures which work in well together. Beginning with 1898, THE IRON AGE composite figures for finished steel and for pig iron are shown, on the same scale. These again are index numbers related to 1913 as 100.

Among the interesting features of the general curve may be pointed out the three peaks in 1814, 1865 and 1920, with the subsequent history of the price trend. After 1814 there was a sharp drop (33 per cent) during two years, followed by a period of relative stability and then another sharp drop (29 per cent) lasting three years more. After 1865 there was a drop (37 per cent) lasting six years, less precipitous than that of a half-century earlier. This, again, was followed by three years of relative stability, after which came another five years of heavy decline (again 29 per cent). The most recent sharp drop (35 per cent), accomplished in one year (neglecting odd months), has been followed by three years of relative stability. If the history of the past is to be repeated in the near future, as many economists think, there should be another considerable drop during the next few years. Present conditions do not appear to promise this.



Commodity Prices, Since 1801, and THE IRON AGE Composite Prices for Pig Iron and for Finished Steel, Since 1898, Are Shown Above. All are indexed, with 1913 averages at 100. It is notable that the 1920 peak was much higher than that of 1865 and just above that of 1814

Future of Machine Tools

O. B. Iles Discusses Outlook for the Industry
in the Next Decade

IN an address before the New Haven (Conn.) section of the American Society of Mechanical Engineers on Sept. 9, O. B. Iles, president International Machine Tool Co., Indianapolis, and president National Machine Tool Builders' Association, will discuss the future of the machine tool industry for the next decade or two. He will speak of the developments which mass production have brought about and stress the need for research work which shall develop for the benefit of both builders and users of tools the best possible methods of cutting metal that may be employed to meet the problems of the future. He will say that the National Machine Tool Builders' Association is most anxious to cooperate with other organizations in promoting such research work.

"For an industry which has contributed so much toward the development of the manufacturing and business interests of the world," Mr. Iles will say, "the men responsible for the machine tool industry have not been commensurately rewarded financially. If there are or have been any large fortunes quickly acquired in this industry we do not know them. The engineering and designing skill and ability have made possible the development of every factory where metal must be machined. A mechanized civilization is founded on machine tools. Without machine tools it would not have been possible to develop mass production of the articles that have contributed and are now contributing to our so-called advanced civilization. So it is quite natural that those engaged in the machine tool industry should inquire, 'What has the future in store for us?'"

Development Has Been Rapid

"The development in machine tool design in the last 25 years has been rapid because of the rapid development of the so-called mechanical age, particularly in the manufacture of metal products during that time. The machine tool designers have been led somewhat by the requirements and demands of the users during that time. If the users demanded a tool for drilling or milling or turning or boring or planing, the designer gave him the best that ability, skill and experience dictated. Tools that a few years ago were considered more or less special are today considered standard machine tools. This transformation is prevalent today and it is reasonable to expect its continuance in the future. Mass production demands larger and more economic production. The advent of high-speed cutting tools demands larger, stronger and more rigid machine tools. It is reasonable to surmise that the limit of cutting tools has not been reached and that the future design of machine tools will have to keep pace with the metallurgist's development of cutting alloys.

"The more experience a machine tool manufacturer has with the performance of his product under the many and varying conditions his machines are called upon to function, the more he is able to strengthen the weaknesses, correct the errors, refine the operations and add to the conveniences of his machine.

"It seems reasonable that the machine tool of the near future should come nearer and nearer the perfection we are all seeking and striving for, in spite of the fact that some of us and our salesmen think we may have reached that stage now. Some of us thought that 20 years ago we had about reached that stage of perfection. Perhaps we were as near perfection then as now considering the requirements then, now and what they will be 10 or 20 years from now.

"The demand and requirements will always to a large degree dictate the design, quality and productive capacity of machine tools. There has always been and always will be a necessary inter-relation between design and development in the metal working industry and in machine tools. The machine tool designer and

builder have had to keep in very close touch with the needs and developments of the user industries. If more strength, more power, greater feeds and speeds and more convenient operations were required by the user, the machine tool builder has had to comply with these requirements. Nor have the progressive machine tool designers and engineers waited for the user to suggest design. The progressive machine tool builders have foreseen many and most of the requirements and endeavored to supply the users accordingly.

"It is reasonable to predict that this condition will continue and increase and that cooperative effort on the part of builders and users of machine tools will grow stronger and closer in the future.

"Some of the leading thinkers and doers in the machine tool industry and many of the largest users think that the demand for single purpose machines, semi-automatics and automatics will become more and more pronounced and insistent. In the past, in the United States, the design and style of machine tools has been very largely determined by the demand in the United States. This applies particularly to special purpose and automatic tools. Inasmuch as the trend in many lines of industry in the immediate past and at the present is toward concentration in large shops and a demand for lower and lower production costs, it is reasonable to forecast an increasing demand for more and more, and better and better automatic machine tools.

"If quantities are large enough, this demand will be likely to lead to combination automatic machines, doing multiple operations of milling, drilling, boring, turning, etc., on one machine. This is being tried in a small way now. Opinion of the leading builders is divided on the extent to which a machine of this type can be economically adopted. One leading machine tool builder says, 'Experience has taught both the user and the builder that segregating operations tends to best workmanship and production. Combining operations leads to complications, which lower production, due to care of tools and break downs.' But with more application of inventive and constructive skill, who shall say that the machine tool designer will never overcome these present troubles?"

Always Need for Standard Tools

"While conditions point to the larger use of automatic and single purpose machine tools in mass production shops, there will always be need and demand for the so-called standard machine tools—engine lathes, drill presses, shapers, etc.—not only in small production shops, but in the large production plants. As the automatics are further developed and refined the next decade will see a still further development and refinement in the so-called standard tools, always meeting the requirements of the future, cutting materials in strength and rigidity and advancing over present designs in simplicity of operation, accuracy and the maintenance of accuracy for the greatest length of time.

"Until recently men anxious and willing to do manual labor have been plentiful. This class of labor has been decreasing and becoming more and more costly. Our system of education has been making white collar help out of them. Our immigration laws are preventing this class of men coming to us. Numbers of our large manufacturers have been largely dependent on immigrants for this class of labor. If this class of labor at a reasonable cost cannot be had some substitute must be supplied. What is there except machinery, particularly automatic machinery to supply this deficiency and demand? The machine tool engineer, designer, and builder, should be very popular and in demand, during the next decade, by the manufacturer of all kinds of machinery and commodities."

Drop Hammers With New Features

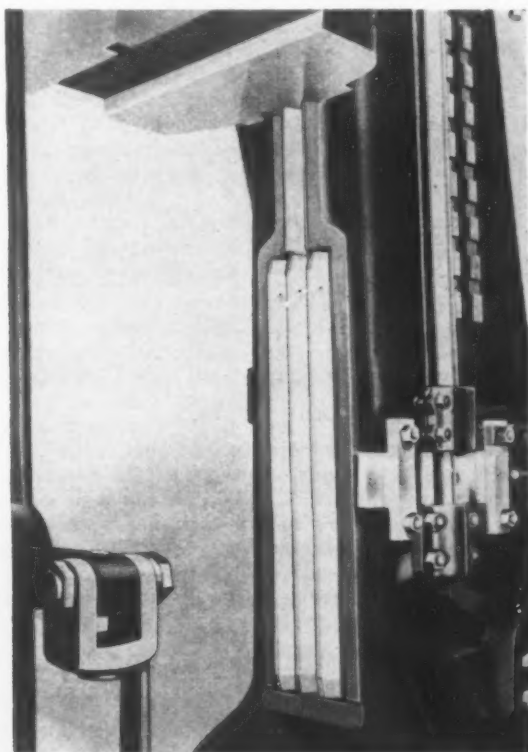
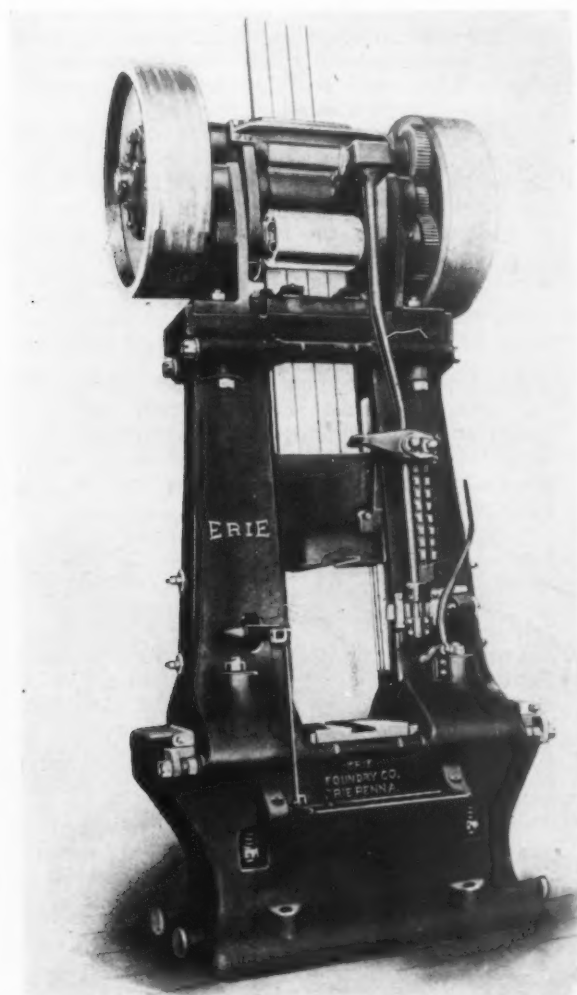
Ram Lifted by Four Rolls Instead of Two—Equalizing Mechanism and Guide Construction New—Savings in Maintenance Cost Claimed

IN operating board drop hammers significant items of expense include the initial cost and installation of boards and the cost and maintenance of belts. To meet the demand for a hammer that would reduce the maintenance cost of boards and belts was the purpose of the Erie Foundry Co., Erie, Pa., in developing the new board drop hammer here illustrated.

In this machine the ram is lifted by four rolls instead of by two, as usual, the area in contact between the rolls and the boards having been doubled. It is

The distinguishing feature of the new hammer is the design of the lifter or head. The head is symmetrical front and back, the only difference being that the front eccentric operates at each stroke of the hammer, being actuated by the friction bar, while the back eccentric is adjustable to accommodate varying thicknesses of boards.

The upright side housings of the head are supported by the heavy cast-steel tie plates, which also carry the floating head or clamp. Journaled in the up-



The Distinguishing Feature Is the Design of the Lifter or Head. The guides in which the ram operates are also of unique design. Cast integral with the upper half of the frames there is a single Vee guide, the bottom half of the guide being held in a pocket in the frame. The guides are interchangeable and may be turned end for end in the pocket of the frame

stated that thus the pressure on the board is considerably less, while the total pressure has been increased so as to make the force for lifting the ram greater. The providing of some means of equalizing the pressure on the two sets of rolls, without the use of a cumbersome mechanism or one which would not withstand conditions of severe service, was finally worked out, the equalizing mechanism adopted being simple in construction and positive in operation. The design permits the use of a gear reduction between the drive shaft which carries the pulley and the two roll shafts. The main drive shaft runs at twice the r.p.m. of the roll shaft, so that the belt speed is doubled and the effective belt pull cut in two. This is emphasized as permitting the use of narrower belts, which are cheaper, and the unit stress on the belt being lower, the cost of belt maintenance is reduced.

rights of the head are the cast-steel eccentrics, each of which carries two equalizers or eveners, which are free to turn about the eccentric. As the eccentric is rotated, the equalizers are forced toward the hammer board. The tops of each pair of equalizers are fastened together by cast-steel bars so that the pair of equalizers will work as a unit and the ends always be in line with each other. The rolls are mounted on shafts which are carried in bores at the ends of the equalizers, one roll at the top and one at the bottom of each pair of equalizers. The pressure put on the board by the rolls is stated always to be equally divided between the top pair and the bottom pair of rolls, regardless of whether or not the front and back of the board are parallel. This is stressed as of particular importance, since frequently a low spot is worn at one point of the board, or the board wears tapered, and without the

equalizing feature one pair of rolls will take all of the load. The latter condition not only damages the board, but also puts high pressure on the roll bearings and strains other parts of the mechanism which are designed to take only half the load.

The eccentric is bored out and bushed with bronze and the main drive shaft runs in these bushings. It carries at one end the driving pulleys and at the other end the pinion, the latter meshing with two gears, one on each of the roll shafts. These gears are constantly in mesh regardless of the position of the eccentric. The pinion being half the size of the gears, the main shaft and the pulleys revolve at twice the speed of the rolls. Therefore, it is claimed, with the same size pulleys the belt speed is twice and the belt tension only half what it would be ordinarily. It is stated that by increasing the belt speed and reducing the effective belt pull the belt can be run at a considerably lower initial tension and will not have to be tightened up so frequently nor be replaced so often.

Massive construction of the machine is also a feature stressed by the company. The castings used are principally of steel, and the shafts, forged parts, gears, etc., are, for the most part, of alloy or special steel. All rotating bearings are bronze bushed and special attention has been given to convenient lubricating facilities. The frames of the hammer are of box section type, similar to those used on steam drop hammers, instead of the usual I-beam section frames.

The guides in which the ram operates are of unique design. On the upper half of the frames there is a single V-guide cast integral with the frame. The bottom half of the guide is a separate piece held in a pocket in the frame, and in the 5000-lb. hammer the

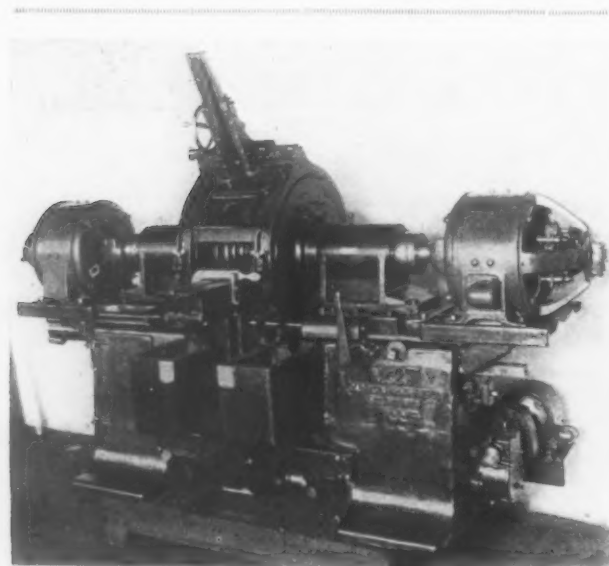
renewable part of the guide has three Vees, as shown in the separate illustration. The guide is of heavy cross section and is strongly reinforced by the frame being supported in the pocket in the frame on five sides. Being designed to serve as a renewable wearing piece, no adjustment is provided in the guide itself. As it wears, or after it has been planed down, the guide may be brought out to the proper location by putting liners between it and the frame. The guides are interchangeable and may be turned end for end in the pocket of the frame. If wear occurs the guides may be changed around until all the available surface has been worn before it is necessary to take the guide out and have it planed.

The ram can be lifted by the rolls in the usual manner up above the level of the top of the renewable section of the guide, and after the ram has been blocked in place the guides may be conveniently removed and replaced. The ram may be also removed conveniently from the hammer to dress up the die notch, this being done by removing the guides, dropping the ram and then removing it from the hammer. The ram is thus removed almost at floor level and without dismantling the hammer or spreading the frames apart. With a spare set at hand the guides may be renewed in a few minutes, and after the Vees have been worn they can be dressed up in a small planer.

As in other of the company's drop hammers, the upper works form a rigid unit which can be moved across the anvil from right to left or vice versa, being moved by adjusting wedges which bear across the back of the frames for the full width. The latch, roll release lever, treadle and other similar parts, follow the standard design of the company's board drop hammers.

Builds Double-Spindle Disk Grinder for Longer Work

A No. 27 double-spindle disk grinder with Oilgear hydraulic feed and similar to the machine described in THE IRON AGE of April 3, 1924, but made longer and heavier, adapting it for longer work, has been brought out by the Gardner Machine Co., Beloit, Wis. The machine is adapted to a variety of large parts with opposite parallel flat surfaces of approximately equal area, and because of its massive construction, it is regarded



Work From 0 to 12 In. Long May Be Accommodated. Oilgear hydraulic feed and massive construction are features

as approaching a record for size and power in the disk grinding field.

Work from 0 to 12 in. long may be accommodated, the standard No. 27, previously described, being only for parts from $\frac{3}{4}$ to $8\frac{1}{4}$ in. long. It carries 20 in. diameter steel disk wheels, interchangeable with 18 in.

shallow-type "Perfection" ring wheel chucks. The base has been lengthened and is heavier, and to obtain longer travel of grinding heads, a longer oil cylinder is used, the operation being the same as in the standard machine. The motor-driven machine is regularly equipped with two 10-hp. motors.

The ways in the subbase, which carries the grinding heads, have been lengthened to 25 in., which is 9 in. longer than on the standard machine. This is stressed as not only permitting greater opening between the grinding members but as reducing wear. Both heads are provided with individual adjustment to compensate for uneven wear of grinding members. The hood inclosing the grinding members is of the telescoping type, which permits a maximum opening between grinding members, with a minimum overhang. The upper half of the hood is hinged to provide convenient access to grinding members.

The machine illustrated is equipped with the company's mechanically-operated swinging fixture with locking work-rest, used for the grinding of coil springs. The machine weighs 6500 lb. and the floor space is 8 ft. x 12 ft.

Making Automobile License Plates

The Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., has issued a four-page circular giving a description of the process by which automobile license plates are made at the State Reformatory at Cheshire, Conn.

License plates for Connecticut are made from annealed and pickled open-hearth steel, which comes in sheets 3 ft. wide, 10 ft. long and 0.025 in. thick. The sheets are first cut crosswise into strips equal in width to the length of the license plate, which varies with the number of figures in the number. The average length is 12 in., so that 10 strips of this width are obtained from each sheet, and each strip, when squared and cut up, will make five rectangular license plate blanks 6 in. wide. The squaring and shearing is done on a power-driven tinner's shear, the two operators of which are able, under favorable circumstances, to cut up 200 sheets in 8 hr., making 10,000 blanks, that is 5000 pairs per day.

The license plates have rounded corners and six holes for fastening to the automobile. These holes are punched out and the corners trimmed to a radius as one operation, using a power press equipped with suitable dies. Two presses of ordinary width for cutting first one end and then the other, or one press wide enough to punch all six holes and trim the corners at one stroke are required to handle the production of 5000 pairs per day.

Embossing the letters and figures and forming the raised border or bead around the edge are done on special presses equipped with special dies that provide for running the license numbers consecutively. The lower or male member is fastened to a horizontal slide on the press, which moves in as the upper or female die moves down. When the lower die is slid outward it is accessible for changing the large characters which are located on the die plate by pins so as to be easily removable and interchangeable. The letters and figures are made from templets, and are ground on both sides to a thickness of 0.120 in. The top edges are rounded all around to a liberal radius to prevent cutting the metal.

In the upper die the area including all the large characters is made up of a rubber pressure pad set into the die plate. When the die descends this rubber

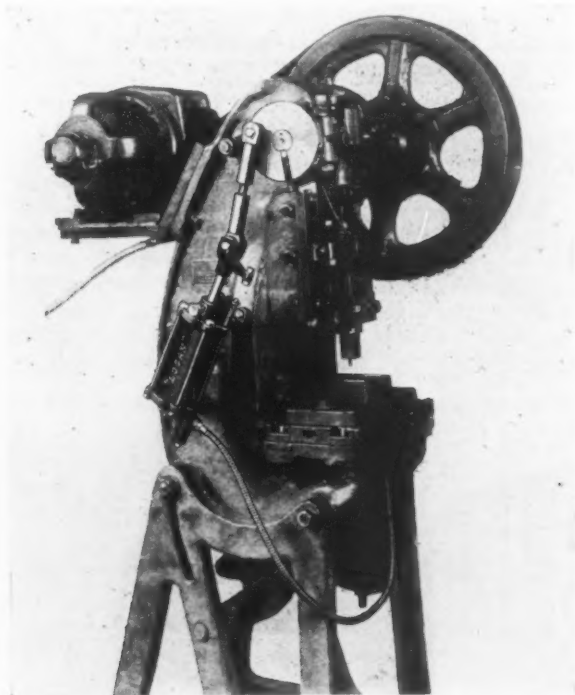
pad squeezes against the blank, stamping the metal down around the raised figures of the lower die. The pad must contain vent holes to allow the escape of trapped air, else the rubber will not force the metal down into every depression.

The embossing is followed by dipping in naphtha or in some other cleaning agent. After drying, the license plates are dipped in a tank of enamel and are suspended to drip off and then baked for one hour in an electrically heated oven at a temperature of 260 deg. Fahr. A second coat of enamel is applied by spraying, using an air-blast of 90 lb. pressure. The license plates are baked a second time and then go to the stenciling machine.

The stenciling machine is of the conveyor type, having a wide canvas belt on which the plates are carried successively under two printing press rolls, which are saturated with enamel and apply two even coats to the faces of the letters and figures. The carrier belt travels at about 30 ft. per min., which is slow enough to enable the operator to distribute the plates over its width while the machine is in motion. They are removed from the opposite end of the machine and placed in a rack preparatory to the final baking operation. One stenciling machine will enamel 6500 pairs of markers in four hours.

Pneumatic Work Ejector Used on Punch Presses

An air compressing device for use in connection with punch presses and other machines, and which automatically ejects the work is here illustrated. By eliminating the necessity for the operator to place his hand between the work and the die, the use of the de-



The Compressor on the Side of the Machine Provides Air for Ejecting Work from the Die. Safer operation and longer life of dies are among advantages claimed

vice removes a common cause of accidents, and blowing the work from the die tends to increase production. The blast of air also serves to remove scale and chips from the die, which feature is stressed as maintaining quality and increasing the life of the dies.

When attached to the punch press the air is compressed on the down stroke of the ram and released on the up stroke, blowing the work from the die into a chute or suitable receptacle. The blast of air may be regulated by means of a pet cock provided.

The device, which is manufactured by the Logansport Machine Co., Logansport, Ind., is of simple construction and may be mounted conveniently on the machine on which it is used. The cylinder is of steel tubing, and the piston and piston cup packings are of the company's standard design. Adequate lubrication is provided. The compressor is regularly available in one size with cylinder of 3 in. bore and 5 in. stroke, which, operating at 60 strokes a minute, delivers air at approximately 60 lb. per sq. in. pressure. For heavy work a 4½ in. and 6 in. bore of cylinder can be furnished special.

Taper Parallel Gages for Measuring Small Holes

A set of taper parallel gages for measuring the intermediate sizes between standard plug gage sizes, from ¼ to 1 in. by thousandths of an inch, has been placed on the market by the Brown & Sharpe Mfg. Co., Providence.

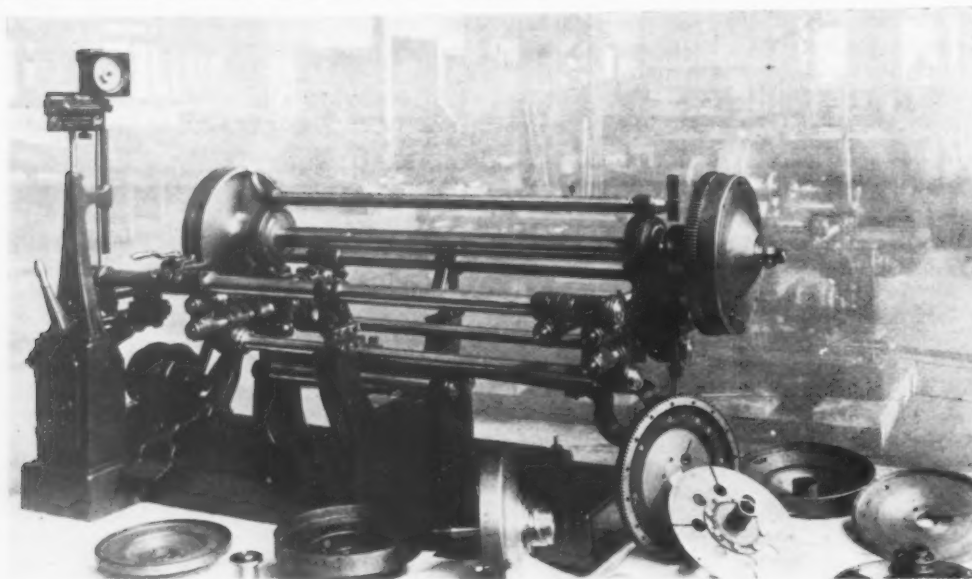
These gages are intended for use in small shops without a complete set of plug gages and for tool-makers in checking out-of-way holes, which are sometimes hard to measure on jig and fixture work. They can be used in blind holes, slots, etc., in different positions, to determine the size of the hole and also whether or not the hole is out of round. They are

Taper Parallel Gages for Use in Blind Holes to Determine Size and Roundness of Holes. They measure from ¼ to 1 in. by 0.001 in.



used in pairs and the two gages which fit snugly into the hole are measured across the extending surfaces with a micrometer caliper or a vernier. The gages are of tool steel, hardened and ground, and the tops or the measuring surfaces are ground on a radius to assure correct measurement.

The plate attached to the cover of the set shows the different lettered gages to be used in holes between ¼ and 1 in. in diameter.



The Machine Measures the Amount of Unbalance and Locates Points at Which Balancing Correction Should Be Made. A simple adapter facilitates loading and unloading. The recording amplimeter is a feature

Balancing Machine for Flywheels and Other Short Parts

The Gisholt Machine Co., Madison, Wis., has added to its line the new precision balancing machine here illustrated, which is designed especially for short parts such as flywheels, pulleys, fans, clutches, etc. The machine employs the same patented balancing process as the company's standard balancing machine previously introduced. Parts up to approximately 50 in. in diameter and 300 lb. in weight may be handled.

The machine measures the amount of unbalance and then locates the point where the balancing correction should be made. The exactness of the readings can be definitely checked by weighing on separate scales the material applied or removed to make the correction.

The process employed for locating the angular position of the correction is also one of mathematical correctness. A simple adapter that facilitates rapid loading and unloading of the machine is a feature and the convenience of operation provided is claimed to assure a constant and high rate of production of parts balanced to a refinement beyond the practical limits of machining.

An outstanding new feature is the recording amplimeter, which permits one man to operate more than one balancing machine. The amplimeter automatically records the readings of the machine; and thus, while one machine measures or locates the amount of unbalance, the operator can load, unload or operate a second machine, or make the balancing corrections on parts whose unbalance has been measured and located.

Alligator Shear Used in Scrapping Ships

The Boston Iron & Metal Co., Baltimore, uses an alligator shear, designed and built for the purpose of cutting up material from scrapped ships. This machine is of all steel construction, of a low-knife automatic type, and weighs 100,000 lb. It is belt-driven and has a double-gear crank shaft, one 8-ft. gear being mounted at each end of the drive shaft. There are also two 10-ton flywheels on the drive shaft. The

shear has a blade length of 48 in. The sections fed to the shear are first cut from the vessels and come to the machine in a variety of lengths up to 60 and 80 ft. with reinforcements attached. The machine is equipped with clutches so that the upper and moving jaw does not make a cut until the operator pulls the rope shown hanging from the arm of the post in the center of the accompanying illustration. After a cut, the shear comes to a standstill with jaws wide open. Doelger & Kirsten, Milwaukee, are the makers.

Material From Scrapped Ships Is Cut, the Machine Handling a Variety of Lengths Up to 80 Ft. The blade is 48 in. long



Foundry Costs and Other Problems

Discussed by Ohio Foundrymen—More Interest in Sales Efforts—Employee Training and Age of Workers—Scrap Losses

FOUNDRY costs and various other problems of vital interest to foundrymen were discussed at the fifth annual convention of the Ohio State Foundrymen's Association, held at the Hotel Breakers, Cedar Point, Sept. 3 and 4. The attendance was over 100, being somewhat less than at the previous conventions owing to the fact that this year's meeting was not held at a foundry center as heretofore.

In his address as president, A. A. Nolte, Nolte Brass Foundry Co., Springfield, Ohio, spoke of the increase in active membership during the year, but he said that the membership should be still larger as he felt that the association had a great deal of work to perform in handling local foundry matters and problems of legislation. With the assistance of associated members it has been possible to carry on cost work but it would be hard to continue this work at its present scope unless there is an increase in both memberships. It is very important, he said, to extend the association's activities in gathering data for monthly reports and, under the recent Supreme Court decision relating to activities of trade associations, the association can go further than it has heretofore on the subject of costs. It is also important, he said, to do something in safety work. The state insurance rates for foundries are high and cannot be reduced without a decrease in accidents. He recommended that the association have an official chemist who would be of service to smaller foundries not employing a chemist.

The association operated within its income during the year and is in good financial condition, according to the report of the treasurer, C. C. Smith, Toledo Steel Castings Co., Toledo.

A résumé of the work of the association during the year was given by the secretary and manager, Arthur J. Tuscany. This included cost work which was broadened during the year, monthly trade reports, quarterly wage surveys both for the State and for certain sections. He called attention to the scarcity of skilled labor which is becoming more serious. The work of the National Founders' Association in the training of employees is in the right direction and should be encouraged. The uniform trade customs adopted by the association have proved a help, he said, in settling disputes between foundries and their customers. Group meetings of foundrymen had been arranged in various sections of the State and assistance will be rendered to other sections that wish to start these meetings.

Lack of Interest in Sales Efforts

One of the weak points in the foundry industry at present, Mr. Tuscany said, is lack of interest in sales efforts. At one time production and production methods were the most important matters of consideration. However, these have now taken second place and sales is the important question. Foundries should know their costs and then figure profit from their costs. One of the great evils of the industry today in his opinion is price shading. Selling its product is the biggest problem that confronts the foundry today. The old plan of selling castings at a price offered by the consumers he declared, is obsolete. The demands of customers are more exact today than ever before and he believed that the association should have a laboratory to furnish advice to foundrymen. The competition of stampings and other products that compete with gray iron and non-ferrous castings is very keen. He suggested that a research bureau for the gray iron foundries and possibly for the non-ferrous foundries be established to help the industries. Unless something along this line is done he predicted that the demand for castings would fall off.

Mr. Tuscany announced that during the year the

association had adopted the plan of taking in associate members from companies having contact with foundries but not engaged directly in the foundry business. The board of directors has limited the number of association members to 50. He stressed the importance of enrolling additional association members. The number of active members was increased by 24 during the year.

During a brief discussion of the secretary's report, it was suggested that a code of ethics be established somewhat similar to the one adopted by the National Machine Tool Builders' Association. It was thought that the adoption of such a code might result in higher business standards.

Sell Castings by Piece Instead of Pound

The report of the cost committee was presented by J. H. Bruce, Bowler Foundry Co., Cleveland, and led to considerable discussion which indicated that the Ohio foundrymen are deeply interested in this matter. Mr. Bruce stated that the association had recently sent out cost cards, one for light or production shops and the other for heavy or jobbing shops and it was expected that the cards will prove of valuable assistance to the members. Cost cards for steel and brass foundries will be issued later. During the discussion members were urged to give more attention to the matter of costs and it was pointed out that other associations, both State and national, had gone further with this work than the Ohio Foundrymen's Association. C. C. Smith, Toledo Steel Castings Co., said that foundries generally are more interested in the pound than in what they are selling. They should consider quality and service and the pound should not have much to do with the price. He believed castings should be sold per piece instead of on a pound basis.

Robert Crawford, president of the Detroit Foundrymen's Association, was called on for remarks and he suggested that the Ohio association be enlarged into a central States association including foundries also in Indiana, Michigan and Illinois. He referred to the fact that these foundries come into competition and said that it is necessary to stabilize the industry, referring also to the number of foundries that had been put out of business in the past few years. He announced that the Michigan association has raised a fund of \$21 for research work in the University of Michigan which will include an X-ray machine for examining castings and that these machines will be put in some of the foundries.

"Legislation" was discussed by Malcolm Jennings, executive secretary of the Ohio Manufacturers' Association, Columbus, Ohio. He referred at considerable length to high bonded indebtedness of Ohio municipalities and urged the foundrymen to vote for three amendments to the State constitution, one of which would compel cities to live within their incomes, another would prevent double taxation and the third would extend the term of office of State officials from two to four years.

Age Factor and Employee Training

Employee training was discussed by L. A. Hartley, director of education of the National Founders' Association. He pointed out that American manufacturers will enter the race for the returning world markets with four handicaps: Higher standards of living, a declining labor market due to restricted immigration, a rapid increase in the death rate among skilled workers and the reluctance of American youth to engage in manual work. He said that the United States census shows that 12.5 per cent of a foundry's labor is between 18 and 25 years of age; 62.5 per cent is between the ages of 25 and 45, and 25 per cent is

between 45 and 65 and over. An investigation in more than 500 foundries shows that a great majority of skilled foundry workers and foremen are in the upper age group. The average age of the highly skilled group is 55 years and the death curve for this group is rising rapidly.

The trade schools, said Mr. Hartley, are doing excellent work for a limited number of industries but are a mere drop in the ocean of training required by American manufacturers. Only those industries capable of using young children can hope for direct benefit of much of the training carried forward in the schools although there is an indirect benefit which should not be overlooked. Many of the children on leaving the trade schools will find employment in the lighter industries and the chances are that they will be permanently lost to the trade they have studied while in school. His conclusions were that only the lighter industries may expect much help from trade instruction in schools and that the heavier industries must either plan to train on the job those children who come to them after several years of work in a lighter industry or take high school graduates. He said that a young man should be encouraged to take up manual labor upon leaving school on the ground that working with his hands is better for his health than taking a "white collar job" which ties him down to a desk.

He spoke in high terms of the Milwaukee plan of employee training but warned that there is danger in holding to one particular kind of training, insisting that different conditions require different methods and that there are excellent systems of training in various sections of the country. One great lesson is gained from the study of the various plans of employee training and that is that, in order to build securely, we must build on existing foundations rather than erect an imposing structure on a borrowed foundation. Nearly every business has some kind of system of training and the real problem is to help the plants with these various systems to prepare themselves better to meet the situations of the immediate future. He also urged the importance of the training of foundry foremen.

Scrap Losses and the Cause

An interesting talk on the mechanical conditioning of foundry molding sand and its effect upon casting quality was given by E. S. Carman, chief engineer, Osborn Mfg. Co., Cleveland. This was illustrated with a number of lantern slides relating to the mechanical conditioning of sand. Mr. Carman's discussion was in a general way a repetition of a talk that he has given recently before two or three other foundry organizations. A year ago he addressed the Ohio foundrymen on reducing production costs by cutting down the scrap pile through better handling and preparation of molding sand. He stated at the beginning of his discussion that his talk a year ago was based on theory but that this year he would present facts.

Many foundries, he said, have scrap losses of over 25 per cent, and the average in this country is estimated at 10 per cent. One large foundry on a production basis has shown by a careful analysis that 55 per cent of its scrap loss is due to sand. On that basis the scrap loss in foundries in this country due to sand was 315,000 tons of castings in 1923. The total scrap loss per year based on a 10 per cent loss is \$57,500,000.

The speaker said that little attention was given to sand until about five years ago, and now hundreds of foundrymen are devoting much attention to the sand problem. Defects in many castings that are attributed to the cupola slag are caused by the bonding material, in his opinion. He showed photographs of castings having defects resulting from various causes including balls formed in the flask and composed mostly of bond or clay that roll up in making the mold and land on the pattern. Another cause of defects, he pointed out, is the little pebbles of metal in the sand invisible to the eye that come in contact with the metal when pouring and cause an explosion. The only way to rid the sand of this metal is through a magnetic separator. Hard spots in the mold made by hand ramming were referred to as causes of trouble. Other defects are caused by facing sand being rubbed off the corners of the mold, bringing the backing sand against the mold. In his opinion only one grade of sand should be used in molding.

Mr. Carman described the Osborn system of treating sand and spoke of some of the advantages of the sand mill made by his company. He referred to the great saving of sand by one foundry that, with improved methods, had operated six weeks without adding new sand to its molding sand. The whole foundry industry is looking to the mechanical conditioning of foundry sand, said the speaker, who also declared that continuous molding is in the reach of small foundries. He predicted that within a few years about all the foundries would be continuous foundries.

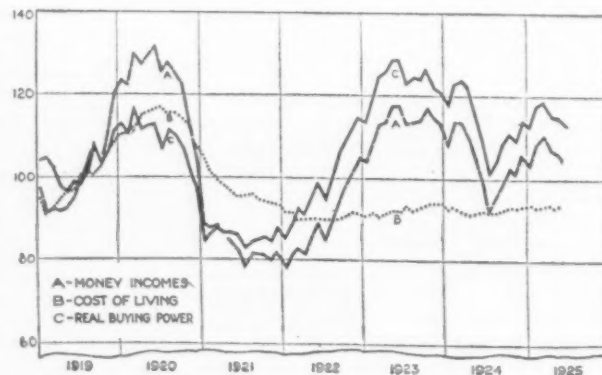
New Directors and Officers

The following directors were elected for the ensuing year: Walter L. Seelbach, Walworth Run Foundry Co., Cleveland; F. W. Huber, American Rolling Mill Co., Middletown; George W. Piehl, Wessling Bros. Foundry, Cincinnati; L. H. Wise, H. V. Dockray Brass & Iron Co., Zanesville, and W. P. Anglemeyer, Star Foundry Co., Troy. The directors elected officers as follows: Walter L. Seelbach, president; C. C. Smith, Toledo Steel Castings Co., Toledo, Ohio, vice-president, and E. Sand, Superior Gas Engine Co., Springfield, Ohio, treasurer. A. J. Tuscany was re-elected secretary and manager.

The social part of the program included an informal convention dinner, after which brief talks were made by some of the guests, a ladies' banquet and dancing party and a round table luncheon. As to the latter, members ranged in groups and discussed various topics including foundry costs, foundry sand and employee training.

Buying Power of Factory Workers

During the first half of 1925, American factory workers were paid at the rate of \$9,730,000,000 per year; compared with \$6,946,000,000 in 1921; \$9,096,000,000 in 1919 and \$7,036,000,000 in 1914. These figures are made public by the Metropolitan Life Insurance Co. of New York, which shows alongside the curve of monthly earnings the curve of real buying power based upon a comparison of monthly earnings and the cost of living. All three curves take the average of 1919 as unity. On this basis, earnings at the middle of 1925 stand about 5 per cent above 1919, the cost of living is about 7 per cent below 1919 and the real buying power is about 13 per cent above 1919. Not since the summer of 1922 has the real buying power been below the 1919 level.



Buying Power Has Been Above Par for Three Years

FOUNDRY CONVENTION

Some Prominent Features of the Technical Program at Syracuse in October

The twenty-ninth annual convention of the American Foundrymen's Association to be held at Syracuse, N. Y., the week of Oct. 5 to 9, will present an unusual program of technical papers and committee reports. In addition to the usual session covering steel, malleable cast iron and non-ferrous branches of the industry, several special sessions will be held, at which foundry refractories, apprentice training, foundry costs, management and foundry sand testing and control will be discussed. Seventeen sessions in all, including the joint meetings with the Institute of Metals Division of the A. I. M. and M. E., have been scheduled. In addition to American writers, papers will be presented by English and French authorities following out the exchange paper arrangement with the European Foundry Association.

Refractory and Brass Problems.—Under the auspices of the A. F. A. Committee on Refractories, a session devoted to the discussion of foundry refractories problems will be held. A luncheon meeting for the discussion of practical brass foundry topics is scheduled for Tuesday, Oct. 6. No formal papers will be presented, but after the luncheon the meeting will be thrown open to all those who have particular problems on which they wish to receive information.

Foundry Cost Accounting.—The A. F. A. Cost Committee plans to have a novel meeting for the benefit of the foundry managers, especially gray iron foundrymen. In addition, the committee is fostering a cost estimating contest. Blue prints of castings will be on display in one of the exhibit booths. From these blue prints visiting foundrymen are to estimate the weights of the castings. A prize will be provided for the one guessing nearest to the actual weight of the casting specified. There will also be on display in this booth sample castings with placards showing estimated costs of production received from various foundries.

Apprentice training, a subject which is of universal interest to the foundry manager, will again be given attention at a special session. Problems which are being met by those actually carrying on such training will be discussed.

Cast Iron.—At no previous meeting has there ever been scheduled such a wealth of papers relating to cast iron founding as have been gathered together for this meeting. Three sessions, devoted exclusively to cast iron metallurgy and shop topics, will be held. Heat treatment, electric melting, temperature recording, in-

fluences of nickel, nickel-chromium, phosphorus and oxygen, effect of changing cupola tuyere sizes, superheating and qualities of core oils, are some of the many topics on which recent research results will be explained.

The paper on "The Oxygen Content of Coke and Charcoal Irons" details the result of an investigation carried on at the Bureau of Standards at Washington. The data obtained is especially noteworthy, as it leads to conclusions which are in direct opposition to the findings of the late J. E. Johnson, Jr., and other investigators. The work of Potter of the University of Minnesota described in the paper on the "Effect of Heat Treatment on the Properties and Microstructure of Gray Cast Iron and Semi-Steel" presents extensive valuable new data for the foundryman in his problem of controlling the properties of his castings.

Steel and Malleable Castings.—Steel foundry subjects are to be discussed at the meetings of Oct. 6 and 7, and in addition the steel foundrymen will find much of interest and value in the general session and of those sessions on refractories and foundry sand. J. E. Fletcher, in his exchange paper, presents some interesting data on the relationships of steel, wrought and gray iron foundry metal production. The influence of varying blast furnace conditions are to be discussed by Mr. Fletcher, who will be present to deliver his address.

An unusually good program has been scheduled for the malleable iron session, at which meeting recent research into factors of annealing will be explained by H. A. Schwartz and Anson Hayes and his associates. B. R. Mayne has prepared an interesting and instructive paper on the use of the group bonus plan as used at the malleable iron plant of the Saginaw Products Co.

Non-Ferrous Foundry Practice.—The non-ferrous foundryman will be extremely well taken care of by the three joint sessions of the A. F. A. and Institute of Metals Division of the A. I. M. and M. E. The luncheon round table discussion scheduled for Tuesday noon of Oct. 6 has been especially planned to give the practical brass foundry shopman a chance to air his views on the many troublesome shop problems which confront him. The other two sessions will be devoted to papers on brass and bronze founding and to aluminum and aluminum-alloy casting. R. J. Anderson will discuss some phases of his recent investigation of the use of X-rays in determining defects in aluminum-alloy castings, while Samuel Daniels will describe the requirements of the United States Army Aircraft Service for its light alloy castings. Atomized coal burning, temperature recording and brass furnace refractories will also be discussed at these joint meetings.

Entertainment features have been amply provided for all members and guests.

To Study for Simplified Practice in Metals

WASHINGTON, Sept. 8.—To become director of investigations into further methods of simplified practice in the metal-working industries, the further possible elimination of waste, and surveys on utilization of metals, William C. Wetherill, has joined the staff of the Department of Commerce. He is on a year's leave of absence from the University of Pennsylvania, where he has been assistant professor of experimental engineering for three years. Among the studies to be taken up are investigations in iron, copper, tin, lead and zinc.

After Mr. Wetherill's graduation from the University of Pennsylvania in 1910 he began his business career with the Link Belt Engineering Co. He later was associated with the Wetherill Finished Castings Co., and the Keystone Screw Co., having been vice-president of the latter concern when he entered the service of the Bureau of Construction and Repair, at the time of the World War. He was assistant in the department of construction of naval aircraft, and was sent to Europe to investigate the navy's equipment and needs.

High prices of metals that must be imported, foreign trade combinations in these metals, substitu-

tion of some of the cheaper and more easily derived metals for those now adding to manufacturing costs, and wearing qualities and replacements of metals also will be considered.

New Coke Plant to Produce Soon

The Hudson Valley Coke and Products Corporation, Troy, N. Y., has started warming up its first unit of 55 coke ovens and expects to begin production about Oct. 1. This battery will consume 1560 tons of coal per day and produce 900 to 1000 tons of coke. The books of the company opened around the middle of August on domestic fuel and to date approximately 60 days' business has been taken. A fleet of automobile trucks will deliver domestic coke in and about Troy. The company's foundry coke books have not been opened. Ultimately the coke unit of the plant will comprise three batteries of 55 ovens each.

The company's blast furnace is nearing completion, the bricking up work and erection of the stoves being in the last stages. The non-arrival of the skip and some minor important items has held up the company somewhat, but it is anticipated the furnace will be put in blast late in October.

Prices Higher on the Continent

Reduction in England Continues—French Appear
Better Off Than Some Others—
German Combines

(By Cablegram)

LONDON, ENGLAND, Sept. 7.

CLEVELAND pig iron is weaker on dwindling demand and the limited production is not being absorbed. Hematite is quieter after recent moderate buying and prices are rather easier. Ulverston has been closed down. The Millom & Askam Hematite Iron Co., on the contrary, has relighted one furnace.

Foreign ore is brighter as to outlook for the last quarter but demand is not yet in evidence. Bilbao Rubio is held at 20s. 3d. (\$4.91) c.i.f. Tees.

Finished steel is dull, with prices tending downward. Semi-finished steel is unable to meet Continental competition, though foreign prices are hardening, on restricted output. Welsh consumers have bought moderately of foreign sheet bars at £4 18s. (\$23.77) and billets at £4 12s. 6d. (\$22.43), both f.o.b.

The Indian Government proposes a renewal of bounties at the rate of 18 rupees (\$6.60, at 36.6c. per rupee) per ton on 70 per cent of the steel production, to Indian steelmasters, for a further 18 months, with a limit at 20 lacs of rupees (\$13,200,000).

Sheets and Tin Plate

Tin plate bars are easier on foreign competition and Welsh makers are considering a revision of official prices. Tin plate demand is improving and the tone is hardening, though some works still are willing to book at cheap prices. South America has bought 24,000 boxes of 28 x 20's. India and the Far East are buying light 20 x 14's. Domestic consumers are covering up to first quarter of 1926.

Galvanized sheets are quieter, but firm on makers' well-sold order books.

Far East demand for thin black sheets is quieter.

On the Continent of Europe

Continental merchant bars are being sold at £5 8s. (1.17c. per lb.); joists, at £5 4s. (1.12c.); both f.o.b.

Rhenish Westphalian producers are endeavoring to form a steel group, so far unsuccessfully, to reduce production costs and run their works at the most economical rates, probably entailing closure of minor plants. The Phoenix Company and the Hoesch Eisen und Stahlwerk, at Dortmund, already have adopted a similar policy.

MARKET SATISFACTORY

French Iron and Steel Situation Better Than Those of Neighbors

PARIS, FRANCE, Aug. 28.—If account is taken of the state of industrial crisis affecting the nations of Europe and of the inactivity inherent to the present holiday period, the situation of the French iron and steel market may, on the whole, be considered as satisfactory.

Coke.—An increase of 5 fr. per ton, as from Sept. 1, on indemnity coke was announced. But it is probable that the increase will finally be somewhat lower. From Aug. 1 to Aug. 18, inclusive, the O.R.C.A. has received 135,173 tons of indemnity coke.

Pig Iron.—Difficulty in placing orders was noted a few days ago, due either to a scarcity of available supplies and exhaustion of quotas, or some hesitation on the part of French ironmasters to bind themselves at present prices over September. French foundry pig iron No. 3 P. L. was quoted at 305 fr. (\$16.70) at the beginning of the year. It suddenly rose to 335 fr.

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.85 per £, as follows:

Durham coke, del'd.	£0 19s.		\$4.61
Bilbao Rubio ore†	1 0½		4.97
Cleveland No. 1 fdy.	3 12		17.48
Cleveland No. 3 fdy.	3 8		16.49
Cleveland No. 4 fdy.	3 7		16.25
Cleveland No. 4 forge	3 6½		16.14
Cleveland basic	3 9½		16.85
East Coast mixed	3 15		18.19
East Coast hematite	4 19		24.01
Ferromanganese	15 10		75.18
*Ferromanganese	15 5		73.96
Rails, 60 lb. and up.	8 5	to £9 0s.	40.01 to \$43.65
Billets	6 10	to 7 5	31.53 to 35.16
Sheet and tin plate bars, Welsh	6 8¾	to 6 15	31.22 to 32.74
Tin plates, base box	0 19¼	to 0 19½	4.67 to 4.73
Ship plates	8 0	to 8 10	1.73 to 1.84
Boiler plates	11 10	to 12 0	2.49 to 2.60
Tees	8 2½	to 8 12½	1.76 to 1.87
Channels	7 7½	to 7 17½	1.60 to 1.71
Beams	7 2½	to 7 12½	1.54 to 1.65
Round bars, ¾ to 3 in.	8 12½	to 9 2½	1.87 to 1.97
Galv. sheets, 24 gage	16 5		3.52
Black sheets, 24 gage	11 5		2.44
Black sheets, Japanese specifications	15 5		3.30
Steel hoops	10 15	and 12 10*	2.33 and 2.71*
Cold rolled steel strip, 20 gage	18 0		3.89

*Export price.

†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron:(a)					
Belgium	£3 2s.	to £3 3s.	\$15.03	to \$15.27	
France	3 2	to 3 3	15.03	to 15.27	
Luxemburg	3 2	to 3 3	15.03	to 15.27	
Basic pig iron:(a)					
Belgium	3 1	to 3 2	14.79	to 15.03	
France	3 1	to 3 2	14.79	to 15.03	
Luxemburg	3 1	to 3 2	14.79	to 15.03	
Billets:					
Belgium	4 12½	to 4 13½	22.43	to 22.67	
France	4 12½	to 4 13½	22.43	to 22.67	
Merchant bars:					
Belgium	5 8	to 5 9	1.17	to 1.18	C. per Lb.
Luxemburg	5 8	to 5 9	1.17	to 1.18	
France	5 8	to 5 9	1.17	to 1.18	
Joists (beams):					
Belgium	5 4	to 5 5	1.12	to 1.13	
Luxemburg	5 4	to 5 5	1.12	to 1.13	
France	5 4	to 5 5	1.12	to 1.13	
Angles:					
Belgium	5 4	to 5 5	1.12	to 1.13	
¼-in. plates:					
Belgium	6 16½	to 6 17½	1.48	to 1.49	
Germany	6 16½	to 6 17½	1.48	to 1.49	
¾-in. ship plates:					
Luxemburg	6 7	to 6 8	1.37	to 1.39	
Belgium	6 7	to 6 8	1.37	to 1.39	

(a) Nominal.

(\$17.87) on the conclusion of the "entente" and is now at 345 fr. (\$16.39).

France, during the first seven months of 1925, has exported 386,000 tons of pig iron, 89,000 tons of which went to Great Britain, 78,000 tons to Italy and 52,000 tons to Germany. In July, the total export was 54,000 tons, more than in June, but less than in January last, when the corresponding figure was 63,000 tons.

Hematite.—This section of the market is very active. Good sales to Italy are noted, at an average of 420 fr. (\$19.93) f.o.t. Modane. At producing works, the average prices done are: 415 to 420 fr. (\$19.70 to \$19.93) in the South West, and 410 to 425 fr. (\$19.45 to \$20.15) in the North and in the East. Price delivered in the Paris area is 445 to 455 fr. (\$21.10 to \$21.60).

Competition of British hematite has practically ceased; prices asked are about 520 fr. (\$24.65) delivered in the Paris area.

Ferroalloys.—The tone of this department remains satisfactory. Last prices quoted, at producing works: ferromanganese, 1650 to 1675 fr. (\$78.30 to \$79.45); spiegeleisen, 10 to 12 per cent Mn, 540 to 550 fr. (\$25.60 to \$26.10).

Semi-Finished Products.—Transactions were at the following prices at producing works in the Thionville area (basic):

	Fr.	
Ingots	410	(\$19.45)
Blooms	420	(\$19.70)
Billets	440	(\$20.90)

Rolled Products.—In this holiday period, business is confined to small renewals and to current purchases from merchants. Inland prices are, for large beams, 500 fr. per ton (1.06c. per lb.) and for merchant products, 530 to 560 fr. (1.12c. to 1.19c.) at producing works in Thionville.

On the export market, prices are much discussed, and deals were concluded for merchant products at

under £5 8s. (1.17c.) f.o.b. Antwerp, at £5 6s. (1.15c.) for beams, and at £5 13s. (\$27.45) for wire rods.

French exports of various steel products during the first seven months of 1925 amounted to 1,100,000 tons, of which 77,000 tons for July.

An order of 13,000 steel fish plates for standard rails of 46 kg. (92 lb. per yard) has been placed at 725 fr. per ton (\$34.40).

Rails.—The fact that there is to be a track overhaul of the whole French railroad system in 1926 is bringing some animation. The distribution among the various producers, of the orders to be given, has not yet been made, but an agreement will speedily be come to, as soon as the total tonnage required is known. French exports of rails during the first seven months of 1925 have reached 130,000 tons.

Sheets.—French exports of sheets during the first seven months of 1925 have reached 54,000 tons, with a maximum of 14,500 tons in July. Imports have dwindled to a small figure and include only a few classes of special sheets. The following prices delivered in the Paris area are being named: Heavy sheets 770 fr., medium sheets 870 fr., thin sheets 1060 fr. (1.63c. per lb., 1.84c. per lb., 2.25c. per lb., respectively).

Hoops.—There is a rather active market in hoops, and interesting orders have been taken for export.

Wire Rods.—Price quoted: 580 to 600 fr. (\$27.50 to \$28.45) at producing works.

Foundry.—Fall orders are now beginning to be felt, especially for heating appliances, in which the campaign just entered into looks promising. In the malleable iron line, notwithstanding the holidays, the works are sufficiently occupied.

Scrap.—France has exported, during the first seven months of 1925, 386,000 tons of scrap, of which 347,000 tons to Italy. July exports were only 36,000 tons, as against 60,000 tons in June.

GERMAN COOPERATION

Syndicates of Steel Makers to Allot Orders on Basis of Economical Production (By Radiogram)

BERLIN, GERMANY, Sept. 7.—Markets for pig iron, steel ingots and sheets are dull, but markets are improving for steel bars, tubes and structural members. Present prices, with American equivalents, include:

Ingots.....195 m. per metric ton,	\$25.41 per gross ton
Blooms.....112½ m. per metric ton,	27.22 per gross ton
Bars.....135 m. per metric ton,	1.46c. per pound
Thin sheets.....163 to 170 m.,	1.76c. to 1.84c.

Krupps, Phoenix Company, Haniel & Lueg, the Rheinische Stahlwerke and Rhein-Elbe Union are negotiating for a union on the basis of the specialization by each in production of the particular sorts of rolled goods, and their complete fusion as a trust is possible. The chief Prussian-Silesian steel corporations also have reached an agreement for a strong fusion.

Strike Lowers Belgian Metallurgical Production

Commercial Attaché Fayette W. Allport, Brussels, cables to the Department of Commerce that the production of iron and steel in Belgium has dropped still further in July, below the reduced output of June, as follows:

Metric Tons	May	June	July
Pig iron	274,800	212,700	168,000
Raw steel	246,710	190,880	151,000
Rough castings	6,010	5,830	3,400
Finished steel	201,490	152,240	128,000
Finished iron	10,880	11,320	3,700

Hopes for the settlement of the metallurgical strike are improving, due to a concession of the employers to take account of the higher cost of living. The Belgian works have slackened activity to the point where the July output was the lowest for any month since September, 1922. Prices have been upset by exchange

uncertainty, and foreign agents are withholding orders.

Iron and Steel Industry Quiet in Luxemburg

LUXUMBURG, Aug. 28.—During July the beginning of the holiday period severely reduced the activity of the iron and steel market, over which hovered already great anxiety, due to the threatening labor conflict in Great Britain and the continuance of the strike in Belgium, which paralyzed the main part of the industry of that country. On the other hand, financial difficulties have grown stronger in a number of countries, notably in Germany.

Under these circumstances, transactions were extremely difficult to close. Only by successive reductions of quotations were Luxemburg works able to secure nearly satisfactory bookings. Far from stimulating the prices, the tension of exchange, persisting during the whole of July, has not offset the rebates which our industrials have been obliged to grant.

Negotiations relative to the quota of exports of Luxemburg, Lorraine and Sarre products to Germany are in abeyance. The meetings relative to an international entente of producers of rails have been postponed to the end of September.

For these reasons, Luxemburg exports to neighboring countries decreased notably in July. On the other hand, there has been an improvement in orders coming from the United States, China and Japan; shipments from the Luxemburg works to these lands represent a far heavier tonnage than for the preceding month.

Six large-type "Stable-Arc" welders are being shipped to London. The welders go to Allen-Iversidge, Ltd., London, which, in cooperation with the Lincoln Electric Co., Cleveland, is putting on a national campaign for use of American-made welders in Great Britain.

Labor Takes Smaller Share of Iron and Steel Mill Incomes

Ratio of Total Value of Products to Payrolls Goes Up; Increase in Living Costs Brings Real Wages Down

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

THE steel industry has been a notable exception to the list of industries which reduced wages as the prices of their products were forced down by market conditions. Despite the drop in the prices of iron and steel, wages have not been reduced. This undoubtedly has had an unfavorable effect on net earnings since spring. Labor has been taking a relatively large share of the total income of the steel mills.

But there are indications that this situation is being corrected and that the stockholders of iron and steel corporations will probably see larger net earnings in the near future. First, payrolls have taken a downward turn, and are declining even faster than the value of products. Second, labor's effective productivity has increased and, with gains from the present volume of business at the mills, is likely to continue the increase. Third, with an increase in the value of iron and steel manufactured, the present tendency for labor's share in total income to diminish will probably be continued.

Ratio of Value to Payrolls Up

THE estimated value of iron and steel produced, based on current prices, decreased a little in July, due to a small decrease both in production and in prices (see Fig. 1). The end of the decline in the value of output, however, is indicated both by the generally favorable forecasts for the industry and by the fact that the value curve shows a much less rapid

decline than in previous months. It is probable that the curve will show at least a small rise when August data become available.

The payrolls of iron and steel manufacturers declined in July even more sharply than did the value of their output. Payrolls dropped 6.6 per cent against an output decline of only 2.9 per cent; the relatively great decline in payrolls being due chiefly to the increased percentage of part-time operation.

It follows that the ratio of value of output to payrolls increased. The July ratio was more favorable than those of either May or June and was far better than a year ago.

As this ratio is a significant index of the trend of earnings in the iron and steel industry, the gain recorded in July is important. The July ratio was closely similar to those which existed in October and November last year. Moreover it is highly probable that increase in values from now on will outrun the gain in payrolls. Accordingly, the outlook for earnings in the iron and steel industry is good. Earnings this fall should be better than they were in the same period last year.

Output Per Man Greater

THE foregoing conclusion is confirmed by the fact that the output of iron and steel per man in July was much greater than it was a year ago. There was a small decrease in July, but it was not nearly so sharp

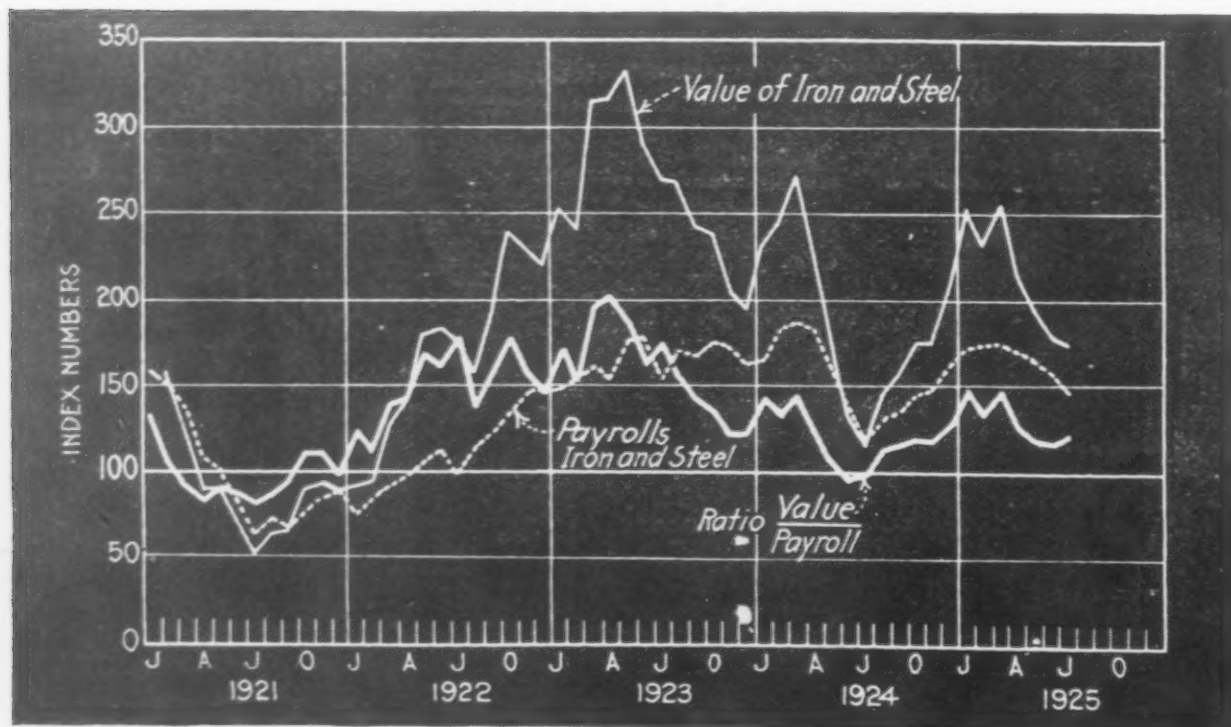


Fig. 1.—Though the Total Value of Iron and Steel Produced Has Shown a Decline, Payrolls Have Recently Dropped Even Faster, Thus Reducing the Share of Total Income Taken by Wages

In This Issue

Lure of low prices on imported steel less powerful today.—Material of doubtful analysis, excessive tolerances in rolling, damaged shipments have dampened desire for foreign steel.—Page 699.

Labor takes less of iron and steel mill incomes.—Workers' earnings drop faster than value of products; "real wages" also lower as living costs rise.—Page 694.

History of prices for 125 years indicates long-time trend is downward.—But present conditions do not promise any considerable drop for some time. —Page 683.

Nearly two-thirds of French steel workers are on 9-hr. basis.—Despite French ratification of 8-hr. agreement; attempt to get German plants on 8-hr. basis likely to fail.—Page 701.

Urges sale of castings by piece rather than pound basis.—C. C. Smith thinks foundries would do well to figure profits on individual jobs rather than on pound prices.—Page 689.

Canada likely to be our best steel customer for many years.—Agricultural voting strength makes imposition of tariff on steel unlikely, since higher prices for farm implements and machinery would be likely to follow.—Page 698.

Uniform arbitration laws to be pushed in most States next year.—New York and New Jersey already have legislation in line with Federal arbitration law to settle commercial disputes in excess of \$3,000.—Page 702.

Lake iron ore shipments nearly one-fourth in excess of last season's.—6,600,000 tons more shipped to Sept. 1, than at same date year ago.—Page 701.

One British steel plant has 28 50-ton furnaces that have never been lighted.—Labor cost in England too burdensome, more labor-saving equipment needed, says Sir Arthur Balfour.—Page 701.

Would smaller dirigibles prove safer than large ships like Shenandoah?—Latest disaster suggests dirigible progress has been made at expense of sound engineering.—Page 698.

Iron and steel higher on Continent, reduction in England continues.—Metallurgical strike in Belgium materially lowers output.—Page 692.

Net immigration drops 60 per cent in fiscal year.—New two-per-cent law means industry must depend more than ever on labor-saving machinery.—Page 699.

New electrolytic process plant produces pure iron in commercial quantities.—Seven tons a day turned out at Niagara Falls unit: said to be especially suitable for deep stamping.—Page 675.

Total annual foundry losses from scrap, on 10 per cent basis, estimated at \$57,500,000.—Mechanical conditioning of sand would save much of this.—Page 690.

Bilbao ores still chiefly mined by hand in open pits.—Hundred per cent increase in wages since war has caused installation of some machinery; minimum wage now about \$1 per day for surface miners.—Page 680.

Removable railing protects open-hearth workers from falling into pit.—Can be lifted out of way during placement of runner or other heavy equipment.—Page 728.

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The Iron Age and Its Readers

IRON in sheet form as ductile as copper provides a new material for the deepest of deep stamping combined with high resistance to both corrosion and rupture. Such a metal is the result of the electrolytic process described in our leading article this week. Necessarily it is expensive, for it is produced in pounds rather than tons and its fixed charges are large. But among its multitude of possible uses are many which can bear a high cost in return for certain required qualities. It is not an untried product, though still undergoing intensive study with a view to improvement in character and to a lower cost of manufacture.

In last week's issue, THE IRON AGE presented to its readers a connected story of heat treatment from its earliest beginnings. It has been decided to include this fascinating account, together with the 104 advertising pages last week, devoted specifically to late achievements of American manufacturers of interest to metallurgists and plant executives, as a souvenir to be given to attendants at the Cleveland meeting next week of the American Society for Steel Treating. The 124 pages will be suitably and attractively bound for permanent keeping.

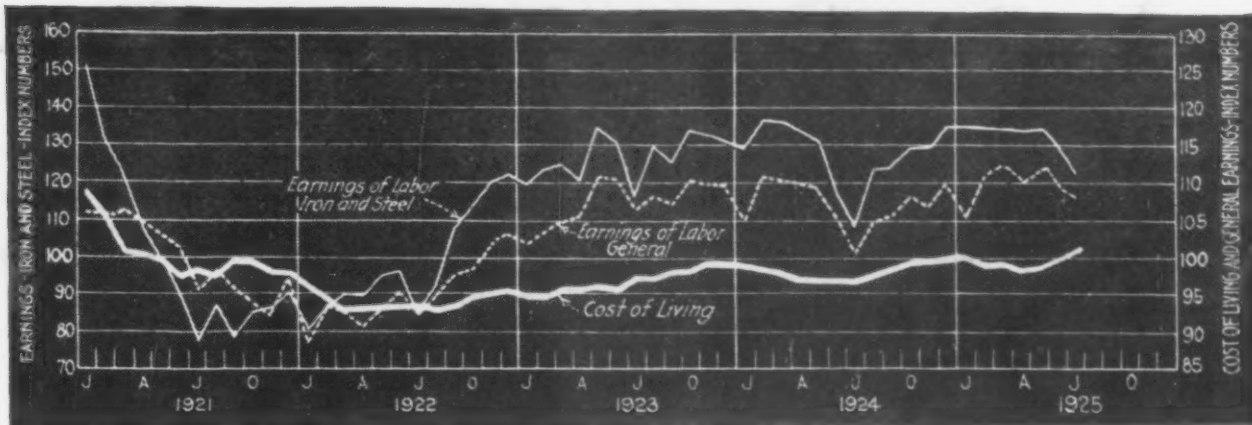


Fig. 2—As in Other Industries, Earnings in Iron and Steel Mills Have Decreased While Living Costs Have Gone Up Somewhat

as in the same month last year, and the gain in productivity which probably began in August will thus start at a higher point.

Tentative figures for July show a sharp gain in the general output of manufacturing establishments in the United States. The gain was greater than that in employment, and we may, therefore, conclude that the productivity of labor in the general manufacturing industry (including iron and steel in the average) is on the upgrade. This is a very favorable indication for industry in general, although it indicates that in July the iron and steel industry was behind the general average in this respect.

Real Wages Are Lower

AS usual in that month, the average weekly earnings of labor employed in the iron and steel industry decreased sharply in July. The decrease, however, was less than in any recent year. In 1923, earnings per capita decreased 10.8 per cent from the previous month; in 1924, 7.5 per cent; this year, 5.1 per cent. Furthermore, labor's earnings in the iron and steel industry last July were higher than in any July since 1920. Much the same statements may be made concerning manufacturing labor in general.

On the other hand, the cost of living as reported by the National Industrial Conference Board reached the highest point since February, 1921. The index was 1.1 per cent over the average for 1921.

It follows that the margin between the average weekly earnings of labor and the cost of living decreased decidedly in July. In fact, it reached the lowest point since January of this year. A study of Fig. 2 will show that the spread between living costs and earnings was about the same in July as it was in January, 1924, and in November, 1922. It is still

considerably greater, however, than throughout most of 1921 and 1922.

This condition of declining surplus purchasing power of factory laborers is significant, but in part, at least, is clearly temporary. Judging by the past, August labor earnings should have partially restored the favorable situation which labor has occupied in recent years. The future depends largely on the trend of living costs. Probably there will be some further increases, but with more reasonable grain and textile prices and a downward tendency in rentals, it seems doubtful if living costs will advance a great deal.

Employment Index Rises

THE actual number of laborers employed in July showed a continuation of the decrease which had been going on in the preceding months, but in some industries this was less than usual for the season.

The adjusted index of employment in the iron and steel industry showed a considerable gain. The actual number employed decreased 1.3 per cent, but this was much less than usual at the midyear turn. The July index was 131.7 against 120.1 last year, showing how much greater the activity in this industry was at the 1925 low point compared with the 1924 bottom.

Employment in general decreased 1.1 per cent in July; consequently the iron and steel industry made a much better showing than the average industry.

Another factor, however, must be considered: the amount of full-time operation. This somewhat reduces the favorable showing in iron and steel. Here the percentage of full-time operation decreased from 88 per cent in June to 87 per cent in July, while the average for all industries remained unchanged at 92 per cent. This fact partly explains the relatively large decrease in labor earnings in iron and steel.

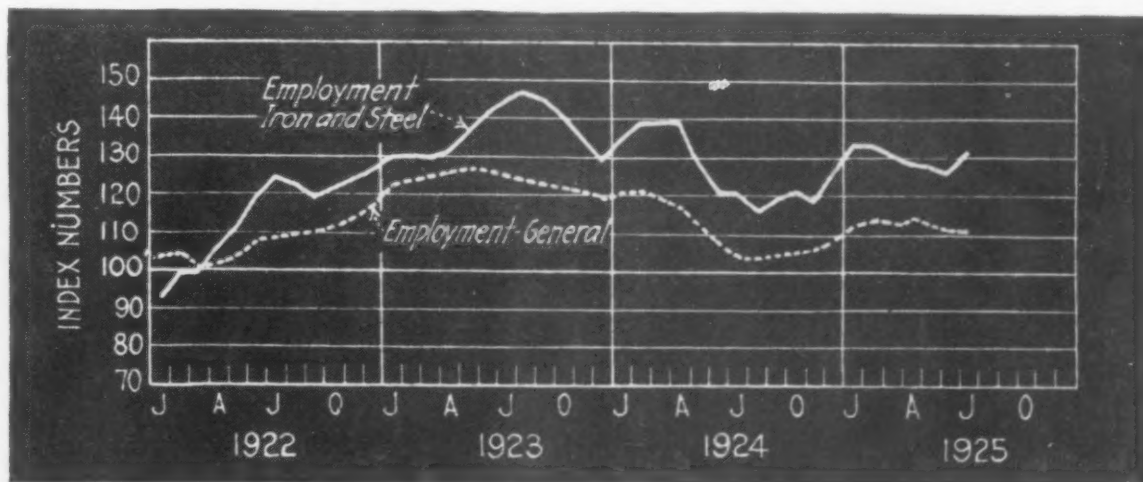


Fig. 3—The Actual Number of Employees in Iron and Steel Mills in July Was Less Than for the Previous Month, But Since the Decline Was Less Than Is Usual at This Time of Year, the Adjusted Index Shows a Gain

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The Shenandoah Tragedy

A NATION mourns the Shenandoah.

Many had seen her in flight; all had seen her in the pictures; a few had examined the great ship at close quarters in the hangar at Lakehurst.

All admired her. The romantic youngsters were caught by her majestic beauty; fireside travelers saw in the Daughter of the Stars unnumbered journeys into uncharted space; the business man, a new factor in transportation; the engineer and scientist, a triumph in light alloys and inert rare gases. Now she lies a stark tangle of twisted spines, gone down in a thunderstorm, wasting many precious lives.

In sober afterthought it is right to take a careful view of the history of dirigibles. In the twenty years since Count Zeppelin made the first, more than a hundred ships have been constructed, yet not a dozen are fit to fly today. Scattered through the intervening years are the wrecks.

Many, if not most, of the disasters have been accompanied by a flare of blazing hydrogen, burning the faint thread of escape from high altitude. Happily a supply of helium has saved some of our American aeronauts from this grizzly horror. More than half of it is now gone, but more can be secured in the future.

It yet remains to learn how to make a metal frame strong enough to withstand the buffeting elements. In this no small progress has been made. Six years ago a new ship broke in two with the utmost ease when coming out of its shed. Four years ago the ZR-2 fell into the Humber in two parts; snapped by too sudden turning. The Shenandoah flew thousands of miles and rode many a gale safely, once with the bow completely torn away, before coming to grief.

And yet we suspect that progress has been made too rapidly. The Majestic, the Leviathan, the Berengaria are the development of the ocean-going vessel for 150 years. Each increase in size, each advance in construction, was tested in dozens of ships sailing the seven seas, and the performance carefully scrutinized and generally approved before it was incorporated into routine

design and made the basis of the next forward move. True, some vessels were wrecked, some mysteriously disappeared. But it is also true that ocean-going liners of today are the culmination of a long series of successes.

Contrast the brief history of the flying ship. Structures of stupendous size, the culmination of a series of disasters! Structures containing a maze of members, the stresses in which may be figured only by very complex analysis, and only for hypothetical loadings on the envelope, by means of certain assumptions which may not approximate the actual conditions in emergencies.

It would seem high time to make haste more slowly. Difficulties and uncertainties increase with increasing size and much more rapidly. Why is it not common sense (and therefore sound engineering) to build smaller ships that will sail, rather than bigger ones that will crash?

Our Best Steel Customer

CANADA'S steel industry is passing through one of the most trying periods in its history. The July pig iron output of only 21,000 gross tons was the smallest since monthly records were started in 1917. Only 73 tons of basic iron was made, compared with 38,600 tons in June. The steel output of 22,400 tons in July was the smallest since October of last year. The July figures represent a decline of 66 per cent in pig iron and of 78 per cent in steel from the outputs in May. While March and May showed the largest output in both pig iron and steel since May, 1924, the average rate for the first half of the year is less than in any year since the war. Meanwhile, Canadian consumption of rolled steel from the United States is growing apace. June and July shipments from this country to Canada amounted to 92,000 tons, or an average of 46,000 tons a month, as against an average of but little over 20,000 tons a month in the first five months of this year.

Steel makers in Canada have been urging in the past year that the imposition of higher duties on iron and steel products must precede any revival of the domestic industry. Thus far all that they

said a year ago of the effect of the transfer of certain forms of steel to the free list and the reductions in duties on other products has been borne out by events. They have plainly stated the case for the building and maintenance of a steel industry at home. Admitting that a price must be paid to acquire such a desirable addition to the home market for Canada's agricultural products, they have urged that the farmers of Alberta and Saskatchewan would be more than compensated for the higher cost of farm machinery, fencing and hardware. However, in the present temper of the Canadian electorate, proposals calculated to raise the price of manufactured products to the ultimate consumer stand about as little chance of adoption as a protective measure would have of carrying a general election in Great Britain. But all apart from tariff amendments, Canada will continue for many years to come to the mills on this side of the line for the bulk of her steel requirements, and thus to be, as she is today, their best customer outside of the United States.

A New Phase of Steel Imports?

HAT importation of iron and steel to this country is entering upon a new phase, marked by better business ethics and more intelligent specification, is a view recently expressed. The American consumer, willing to buy the foreign product when offered at advantageous prices, has been educated in the past two years by unfortunate and at times costly experience. Arrival of shipments in damaged condition has been as much due to the importer's inexperience in specifying as to the negligence of the mill itself. Material of an analysis that raised doubts as to its future performance, or rolled to tolerance of a wideness unknown to domestic mill practice, has proved highly expensive to importer as well as consumer. The irresponsible or inexperienced importer, willing to save the domestic steel user any amount of money regarded sufficiently impressive to make the sale, is finding repeat orders conspicuous by their absence.

Profiting by unpleasant experience, foreign mills, whether in Belgium, France or Germany, are now offering material that will satisfy the buyer in the United States, even though at a higher price, usually \$2 to \$3 a ton more, than in the case of sales to less particular world markets. As a result, domestic consumers with plants close to the Atlantic seaboard have been known on occasion to buy foreign material at a saving represented only by the freight from the mill that has been their usual source of supply.

Another phase of current importations is the successful effort being made by agents in the United States to sell out of stock. It is the smaller consumer who is more ready to buy foreign steel, or, in the case of pig iron, the small foundry working on meager capital. On the other hand, the small order sent to the mill abroad is expensive to handle and yields but little profit to the importer, who meets another obstacle in the need of the purchaser for prompt delivery.

Thus a considerable business has been done through the medium of the warehouse chiefly or exclusively devoted to the foreign product and operated by the importer. Such a warehouse estab-

lished at a Gulf port last year has been doing a business of very considerable proportions. A few months ago a house experienced in foreign trade secured an agency from a German syndicate and is operating warehouses in California and Texas, selling tubular products to the oil fields. Consideration is being given also to the establishment of a foreign iron and steel warehouse in the New York district. An importer of cast iron pipe furnishes from stock some of the smaller lots of water pipe. In the pig iron trade on the Eastern seaboard one factor is a stock carried on a New England dock and maintained by cargo shipments from Europe.

The official statistics of iron and steel imports are giving testimony quite in line with what is indicated above—that the lure of extremely low prices is no longer so influential with American buyers. Estimates made early in the year that foreign steel would be a large and increasing factor in the domestic market have not been borne out. Iron and steel imports in July, at 64,000 tons, were 22 per cent less than in June, and the amount of finished steel—about 20,000 tons—was less than in any month since November. If the recent trend continues, and the import trade, so far as rolled steel products are concerned, becomes in considerable part a business of selling small lots from stock, meeting standard specifications as to analysis and physical properties, some alarmist writing concerning the European steel invasion will need extensive revision.

Labor Conditions and Immigration

A NATIONAL Industrial Conference Board study of immigration statistics, following the completion of the fiscal year June 30, marks the first twelvemonth of the operation of the new 2 per cent law, based on the 1890 census. A statement has been issued which will no doubt have wide circulation and receive close attention.

In a nutshell, the finding is that from the last year of the old quota law to the first year of the new there was a decrease of 60 per cent in net immigration, defining this as immigration minus the departure of aliens. The figures given are: 1923-4.—Immigration, 706,896; net immigration, 630,107. 1924-5.—Immigration, 294,314; net immigration, 201,586. Canada and Mexico furnished 130,193, or 64½ per cent, of the net immigration of the fiscal year just ended. Many countries showed more aliens departed than immigrants arrived, Italy leading with a net emigration of 20,948, Greece being second with 5748.

There can be no doubt that the country at large, whatever the various reasons may be, is well satisfied with the present immigration law as a whole, and substantial changes are unlikely. Furthermore, among aliens as a whole there cannot be any great desire to be in this country or the departing of aliens would not be so conspicuous.

It is too late to say that industry in the United States must now adjust itself to the new conditions. It has been engaged in adjusting itself, and it will merely have to continue. The common conception is that it is largely a matter of "common labor" and there is no reason to question the

close association of common labor with immigration and the departure of aliens.

The Industrial Conference Board finds that the proportion of foreign born white aliens to total population has remained fairly constant at less than 14 per cent, being computed at 12.9 per cent in 1860, 13.1 per cent in 1880, 13.4 per cent in 1900 and 13.0 per cent in 1920. This percentage in future will decrease rather rapidly.

When it is said that industry is engaged in adjusting itself to a diminishing supply of common labor, it is far from the fact to relate this chiefly to the condition as to the number of proportion of foreign born persons in the United States. We know perfectly well that years ago a much larger percentage of the native born were common laborers than has been the case lately. The introduction of machinery has been continuous, and the proportion of common labor required for getting a given amount of work done has been decreasing right along. Indeed, it was a very familiar argument not very long ago that we just had to have immigration because "Americans" would no longer do common laboring work. There had been a time when they were doing it.

Industry has always been full of fresh examples of the displacement of common labor by machinery and other improvements. As old cases are forgotten new ones arise. The individual cases are innumerable, but it is not difficult to pick out single instances in which many men are involved.

The trade is just now giving some consideration to the question whether the Connellsville coke region will have sufficient labor to expand its production, when the last report of the Connellsville *Courier* shows a production of 99,670 tons of coke in a week, representing a rate of about 5,000,000 tons a year. In 1912 and 1913 the region made 20,000,000 tons of coke, or four times as much, with practically no concern about labor supply. This suggests what one thing—the by-product coke oven—has done as to common labor.

Nationalization of Coal Mines

IT IS well known that the United Mine Workers have been considering for a long time the idea of nationalizing the coal mines of the United States, both bituminous and anthracite. At the convention of this union in 1919 a committee was appointed to formulate a plan for this purpose. Several years later its recommendations were made public, but not much attention was given to them until within the last week. The main suggestion was the purchase of the nation's entire coal resources, developed and undeveloped, for 4.5 billion dollars, and the administration of them by a Federal commission of mines, actual operation to be put into the hands of a technical group.

The basis of this idea is that coal is a public utility and should be administered as such. This is a far-fetched idea, for coal mining is naturally a competitive industry, while municipal transportation, distribution of electric current, the use of the telephone, etc., are desirably made non-competitive. Even in respect to them, we have not yet gone beyond state regulation, stopping far short of nationalization.

The project for nationalizing the coal mines if subjected to economic analysis would be found to be intricate, and not a thing to be discussed only casually. Nevertheless, we may remark on some prominent points.

If the coal mines of the country were purchased, interest and amortization charges would begin immediately and would always have to be paid, whereas now the owners do not get anything if the mines do not earn anything. The undeveloped coal lands would involve an immediate capitalization of reserves that can not be liquidated inside of 30 years and consequently have theoretically no present value (or so slight as to be negligible); but their holders would never hand them over on such a principle.

In 1918 the coal mining companies of the United States reported net incomes of about 180 million dollars and deficits of about 9 million, making a net of about 171 million for the industry, this corresponding with about 25 cents per ton of coal produced. We do not think that in any subsequent year the industry as a whole has done so well. In 1921 the net was only about 10 million, that being well remembered as a bad year in all industries.

In their income tax returns the coal mining corporations no doubt made proper deductions for depletion. Therefore, the interest charge on 4.5 billion does not have to be increased, for the purpose of present computation, in order to take care of refunding. There is no present evidence that the coal mines of the country could yield 180 million dollars a year, or 4 per cent on 4.5 billion, as true net income right along. Probably all of the producing coal mines of the United States are not worth 4.5 billion dollars on the basis of capitalization of earning capacity, present and prospective. The purchase of all the coal lands, however, might easily require financing of that order.

But, supposing that the coal mines and coal resources were nationalized by purchase, what would be the result of Federal administration? Federal administration is not even able to run the postal service economically. It made a colossal mess of operating the railroads, also of the shipping adventure. It has been the experience in every country that governmental bureaus can not economically conduct business.

Nevertheless, let us assume that a Federal administration of collieries could be conducted with the same intelligence as that of the United States Steel Corporation. How would the fundamental difficulties be solved? What would be done with the 200,000 superfluous bituminous miners? What would be done with restrictive and interfering legislation by the several States? What would be done about mines that are operated by industrial companies for their own supplies? The proposal bristles with so many difficulties that we can readily understand why Mr. Lewis, with his superior intelligence, does not indorse it.

The high command of organized labor has no illusions as to the Government in business; no more than we have. The sub-leaders have pipe dreams of wage scales according to wishes, but their superiors appreciate that it is only private management that can produce enough to afford any decent wages; and they are not sufficiently fatuous to imagine that the American people would consent to any such thing as the British Government did lately.

WORLD STEEL PROBLEMS

Latent Capacity Untested, Says Sir Arthur Balfour—Revolutionary Effect of Alloys—French and Belgian Competition

"The great trouble with the iron and steel industry today is the great latent capacity which has never been tested," declared Sir Arthur Balfour, prominent British steel maker and president of the Balfour Steel Co., Sheffield, England, in an address before a joint meeting of the Cleveland chapter of the American Society for Steel Treating and the Cleveland Engineering Society, Sept. 2. The address followed a banquet given in Sir Arthur's honor by the Cleveland chapter of the steel treaters. In connection with his statement regarding the latent steel-making capacity, Sir Arthur mentioned that one British plant had twenty-eight 50-ton furnaces that have never been lighted. "A large volume of steel business is being done in the world today but at too narrow a margin of profit," he continued.

Sir Arthur took for his subject the effects of the war on the iron and steel trade and touched at some length on various economic conditions, largely growing out of the war that intimately affect the steel industry and some of which placed a heavy burden on English steel makers by increasing the cost of production.

Alloy Steels and Alloy Scrap

Referring more particularly to some of the developments and problems in the making of steel, Sir Arthur declared that the introduction of alloys has revolutionized the steel industry. Competition in making steel was never keener than today and production is more of a problem than heretofore because of the introduction of alloys. One of the great difficulties of the future, in his opinion, is dealing with the numerous grades of alloy scrap.

He expressed surprise at the remarkable development that has been made in the control of heat-treating furnaces in this country which came to his attention during recent visits to many plants and referred to the progress of the American steel industry in photomicrography in which he said we lead the world.

There is danger in England and possibly in this country, the speaker pointed out, of losing sight of the old time practical forgerman and roller in the steel industry. The scientific and the practical man should work together and he hoped that the skilled man would not be lost by being buried by the scientific man.

Restriction of Output

There is talk now, he said, of international agreements among steel makers, the object of which will be to restrict the output. To this he was strongly opposed. It would not look right for steel makers to talk of restricting output when they are opposing reductions of output by labor. Instead of restricting output he would have steel produced as cheaply as possible so that its consumption would be increased. He said that recently he had made a careful investigation of steel making costs in England and found that 28 per cent of the cost is in transportation and a larger percentage in labor in one form or another. "Labor cost in the steel industry is against us and is growing in our country and a way must be found to reduce the item of labor by the use of labor saving equipment. You in America are ahead of us in this respect," he said.

Competition from Belgium and France

Referring to competition in the steel industry, he said, "The keenest competition is coming from the Belgians. They can produce steel cheaper than any other country, but there is nothing new in that. They always made steel cheaper."

Sir Arthur expressed himself as strongly opposed to restricting the steel industry to an 8-hr. day. Although France ratified the 8-hr. agreement, 62 per cent of the men in the French steel plants are working 9 hr. a day. Efforts are being made to induce the German steel industry to go on an 8-hr. day, but the Germans are going to work as many hours as are necessary to

get out from under the war load. The war changed the balance of the export trade of the world for, by the Alsace settlement, France now has 5,000,000 tons of steel to export.

British Economic Conditions

Taking up some of the economic conditions that affect the British steel industry, Sir Arthur said that the government is now spending £400,000,000 every year for social service, including pensions and other items which is seriously affecting production costs. His country, he pointed out, in addition to the great burden of the war taxation, is also burdened by national wage settlements and must get away from these and come back to sectional settlements. He also referred to inequality in wages as another great handicap, mentioning that tramway workers are paid about 50 per cent more than some of the skilled workers in the steel industry.

He declared that the return to the gold standard was the greatest achievement since the war, and that the iron and steel trade could not be carried on without a sound credit system. He predicted that France and then Italy would follow England in adopting the gold standard.

A Tone of Optimism

Although citing numerous problems that confront the British steel industry, Sir Arthur's talk displayed a general tone of optimism. "We are struggling through very difficult times in Great Britain but are sure we will overcome them," he declared. Among other factors that tend to improve the outlook is the attitude of English labor. The English worker, he said, is beginning to realize that if he wants a high standard of living he must produce more and English labor is starting to produce more.

Lake Iron Ore Shipments in August

Iron ore shipments from the Lake Superior region in August were larger than those in August, 1924, by 27.55 per cent. This year they were 8,532,718 gross tons, which compares with 6,689,567 tons in August, 1924, an increase of 1,843,151 tons. The tonnages by ports, with the season's shipments and a comparison with 1924, are given as follows:

	August, 1925	August, 1924	To Sept. 1, 1925	To Sept. 1, 1924
Escanaba	807,394	597,819	3,408,734	2,339,881
Marquette	499,763	348,357	2,032,244	1,458,001
Ashland	1,229,434	627,632	4,353,947	3,304,820
Superior	2,350,907	2,207,256	9,692,816	9,579,365
Duluth	2,681,902	2,193,014	11,974,105	8,806,549
Two Harbors	963,318	715,489	3,995,307	3,308,093
Total	8,532,718	6,689,567	35,457,153	28,796,709
Increase	1,843,151		6,660,444	

The increase in season shipments to Sept. 1, 1925, has been 6,660,444 tons or 23.13 per cent. This year Great Northern's proportion of the total season shipments was 25.11 per cent compared with 30.66 per cent to Sept. 1, 1924. Duluth's proportion was larger this year or 33.77 per cent against 30.58 per cent.

Coal Saved by the Railroads

Class I railroads saved almost \$22,500,000 on their fuel bill during the first half of this year compared with the first half of last year, according to the Bureau of Statistics of the Interstate Commerce Commission.

The total cost of coal and fuel oil for the first half of last year was \$185,572,620 as against \$163,120,525 for this year. The saving of \$22,452,095 resulted partly from a decrease in the price of coal and partly from economies of the railroad management. Owing to these economies the railroads consumed 13 lb. less coal (including the equivalent coal tonnage for fuel oil used) per 1000 gross freight ton-miles and 1.1 lb. less per passenger train car-mile in the first six months of the year than in the corresponding period last year.

The American Steel Co., Ellwood City, Pa., has recently acquired the patent rights for the Snapon tire chain, which has been on the market for two years, and will manufacture them at Ellwood City.

BUSINESS ARBITRATION

Provisions to Avoid Court Congestion, Delays and Inordinate Expenses—Federal and State

WASHINGTON, Sept. 5.—Prepared in answer to questions in the minds of business men, the Kiplinger Washington Agency, this city, has issued a concise analysis of the New Federal Arbitration Act, which is designed to settle disputes out of court and at the same time to make awards of the arbitrators as binding as decrees of courts. The law becomes effective Jan. 1, 1926, and awards by arbitrators are made enforceable in Federal courts. The analysis points out that business concerns are already drafting arbitration clauses for inclusion in their contracts and that trade associations and chambers of commerce are planning the establishment of arbitral tribunals to help their members settle trade disputes outside the courts.

It is declared that uniform State arbitration laws will be sought in most States within the next year. The State laws, it is asserted, will cover intrastate transactions, will be in harmony with the Federal law, and also will facilitate interstate dealings. New York and New Jersey have uniform laws similar to the Federal statute. It is pointed out also that some States have laws providing arbitration machinery for enforcing awards after they are made, but not enforcing agreements to submit to arbitration. The statement points out the principal basis of the new law as follows:

The Federal arbitration law is the principal basis. It provides this: A written agreement in a contract to submit any controversy arising under the contract to arbitration is valid, irrevocable and enforceable in Federal courts. Thus the authority of the courts is behind the private arbitration action, even though the court may never be called into action. If an arbitration agreement exists, then the parties must arbitrate. When the arbitrator renders an award, it must be accepted, or the court will enforce it. Parties may choose their own private arbitrator or arbitrators, but if they do not, the court will appoint them. There are certain safeguards to insure justice; the court may review arbitration awards for fraud or misconduct, and either modify or set them aside, but only for certain definite restricted reasons. The agreement to arbitrate is entirely voluntary but, having been agreed upon, it cannot be disregarded. Only disputes involving \$3,000 or more, and arising in interstate commerce, are enforceable in Federal courts.

Private arbitration, tested in limited past application, does these things: Saves much of the cost of litigation, cuts down the time of settlements, "gets the money and washes the slate clean," avoids the terrible congestion of the courts, allows settlement at the hands of an arbitrator who knows the trade practices peculiar to the dispute. The arbitrator may contribute the same expert knowledge ordinarily furnished by expert witnesses on each side, who sometimes merely confound the judge and jury of laymen. In practice, the existence of an arbitration agreement serves to stimulate settlement of disputes without resort to arbitrators or appeal to courts. Arbitration tends to produce quick justice, cutting sharply to the issue, and settling it. It provides a system of business men's courts, by, for and of business men.

The main fear about arbitration has been that, if an arbitration agreement or award may be appealed to a court, then the dispute might as well be taken to the court originally. The answer is that arbitration is so quick and simple; the red-tape of court procedure is avoided. Furthermore, in practice, arbitration awards have shown such substantial justice that 99 per cent have been accepted by both parties without appeal to courts. The thing works. Some lawyers have doubted; now they are swinging around.

After a brief discussion of the origin of arbitration in England and its use in the United States for more than 100 years, the report says that the Arbitration Foundation, Inc., was established to promote the arbitration movement, assist local trade bodies in the actual work of arbitrating, furnish a central bureau

of information, collect funds, and expend these funds for material to be distributed mainly through members, including trade bodies or arbitration tribunals. The Arbitration Foundation grew out of the arbitration work of the Chamber of Commerce of the State of New York.

Officers and directors are: President, Charles L. Bernheimer; vice-presidents, Seymour L. Cromwell and Charles T. Gwynne; secretary, J. Winter Davis; treasurer, Alvin W. Krech; executive director, Albert St. Peter; directors, Charles E. Hughes, William E. Knox, Charles M. Schwab, Owen D. Young, Paul M. Warburg, J. H. Tregoe, W. J. L. Banham, Anson W. Burchard, Seymour L. Cromwell, Lucius R. Eastman, Frederick H. Ecker, John F. Fowler, W. H. LaBoiteaux, W. W. Nichols, Ramsay Peugnet, James H. Post, James Brown.

California's Steel Fabricators' Organizations

The California Institute of Steel Construction has been adopted as the official name of the organizations of the southern as well as northern California steel fabricators, which have previously operated as the Structural Steel Institute of California and the Southern California Division, American Institute of Steel Construction. The San Francisco fabricators will be known as the Northern Division as mentioned in these columns July 23, and the Los Angeles group will be designated the Southern Division.

Robert P. Miller, vice-president and general manager of the Union Iron Works of Los Angeles, has been elected permanent chairman of the Southern Division. Other officers are W. B. Kyle, vice-president and general manager McClintic-Marshall Co., vice-chairman; and Benjamin Harwood, vice-president Llewellyn Iron Works, chairman of the executive committee. John Clymer is manager of the Northern Division, with headquarters in San Francisco.

Plans for the adoption of a uniform contract form, embodying the standard specifications and the standard code of practice of the American Institute of Steel Construction, are being completed by the Southern Division.

Members of the Northern Division of the organization are as follows: California Steel Co.; Central Iron Works; Dyer Brothers Golden West Iron Works; Golden Gate Iron Works; Herrick Iron Works; Judson Mfg. Co.; Mortenson Construction Co.; Pacific Coast Engineering Co.; Pacific Coast Steel Co.; Pacific Rolling Mill Co.; Schrader Iron Works; Moore Dry Dock Co., and Western Iron Works.

The Southern Division members are as follows: Baker Iron Works; Brombacher Iron Works; Philip Friedman & Son, Inc.; Lacy Mfg. Co.; Llewellyn Iron Works; Lowth Iron Works; McClintic-Marshall Co. of California; Modern Iron Works; Pacific Iron & Steel Co.; and Union Iron Works of Los Angeles.

American Car & Foundry Co. Buys Coast Plant

The American Car & Foundry Co., through its New York executive office at 165 Broadway, confirms a report from San Francisco that it has purchased the plant of the Hall-Scott Motor Car Co. at Berkeley, Cal., manufacturer of Fageol motors and Ruckstell axles. The purchase price is said to have been \$2,000,000.

Upon the return from California of officials of the company who negotiated the purchase further details of the transaction will be made public.

Data on Siberian iron ore deposits and of other metals alloyed with iron are presented in Trade Information Bulletin No. 359, issued by the Bureau of Foreign and Domestic Commerce. This may be purchased from the Superintendent of Public Documents, Washington, for 10c.

IMPORTING GERMAN NAILS

Low Prices on Pacific Coast—Bridge Work in Washington and Oregon

SEATTLE, WASH., Sept. 5.—Sales managers of some Eastern steel companies, as well as several local jobbers handling heavy steel products, report that August was the best month this year in orders received. September is expected to be equally good or better. As yet there has been no betterment in prices; in fact, on some lines, notably steel bars, shapes and plates, lower prices were made in August than in any month this year.

It is understood that the project for a blast furnace to be built in the Seattle district by the Pacific Coast Steel Co. has been definitely abandoned; also the later idea that the furnace might be built at Long Beach, Cal. The main reason for this action was inability to find suitable coal and ore that could be laid down at the furnace at costs, making it an economy to the company to manufacture its own pig iron. The company operates its four 50-ton open-hearth furnaces almost entirely on scrap, buying a limited amount of pig iron from the Columbia Steel Corporation's furnace at Iron-
ton, Utah, and occasionally from other sources.

Considerable city, State and county bridge building is going on in Oregon and Washington, and some fairly large contracts for steel have lately been placed. The United States Steel Products Co. has taken about 600 tons for the Columbia & Cowlitz Railway bridge over the Cowlitz River. Bids were opened at Tacoma, Wash., on Sept. 2 for a bridge over the Puyallup River, 1800 tons, but the award will not be made for a week or more, and the bridge may be built of concrete. On Sept. 3 bids were opened at Portland for a Masonic temple, 300 tons, and Sept. 15 is the day for bids on 1500 tons for the Bridge of the Gods over the Columbia River. Bids will soon go in on 1300 tons for a bridge at Vantage Ferry, Ore. These jobs have brought out some low prices, and 2.35c. on plain material has been shaded by one or two of the Eastern mills. This price means not over 1.65c. at Pittsburgh mill.

Plates have been dull for some time, and the only large job in sight is a new 30-in. water line at Eugene, Ore., about 1100 tons. It is understood that two Eastern mills have named a price lower than 2.35c., delivered,

on these plates. Generally the local market on tank plates has been 2.35c. to 2.40c., delivered here. A California mill is taking a good part of the local work in narrow plates.

Merchant steel bars are quiet, but there is more activity in reinforced bars, most of the business being placed with the Pacific Coast Steel Co. Merchant bars have been sold as low as 2.25c., delivered, but this was an exceptional price. The quotation on merchant bars in small lots has been 2.35c. and on reinforcing bars about 2.45c., delivered. The State highway bridge over the Puyallup River will require 700 tons of reinforcing bars and the Elwha River bridge 200 tons.

The local market on wire products is disturbed by importations of wire fence and nails from Germany. Only a limited tonnage from Germany has come into Seattle thus far, but it is said that quite heavy importations have been made by jobbers and consumers in Portland, Ore., and at prices much below those quoted by Eastern mills. It is reported that German wire nails have been laid down in both Seattle and Portland at less than \$3 base, per keg. Eastern wire and wire nail mills are finding it difficult to get into this market, as the freights are much against them.

The advances in sheet prices made by the Eastern mills recently have not cut much figure in this market as yet. When prices on galvanized sheets got down to 4.20c. or less at Eastern mill, local jobbers and consumers loaded up rather heavily, and now have stocks or orders with the mills that will run them for some time to come. Black sheets were sold here below 3.15c., Pittsburgh mill, and local consumers covered their needs on these also. Eastern sheet mills are finding it difficult to meet the competition of California sheet mills in Seattle and adjoining territory.

A Western road is in the market for 1600 kegs of railroad spikes for fall delivery. The local Pacific Coast Forge Co. is a maker of a full line of spikes, and is taking most of the business originating on the Coast. This company is quoting standard railroad spikes 5½ in. x 9/16, at \$3.40 per base keg, f.o.b. either Seattle or Portland.

Scrap is very quiet. Heavy melting steel scrap, such as plate ends, frogs and switches, is quoted at \$16.50 to \$17, delivered at buyer's mill; cast scrap, \$13 to \$13.50, delivered. The Pacific Coast Steel Co., the largest local buyer, has bought very little scrap for several months.

EXPORTERS INACTIVE

Japan Inquires for Cannery Tin Plate in Small Lots—Importing Barbed Wire

NEW YORK, Sept. 8.—While inquiry from Chinese markets is in fairly good volume, the Japanese market is inactive. Purchasing is small and it is believed by exporters in New York that the lower prices being quoted by British and Continental mills on certain products is diverting much of this business from American mills. On black sheets, for example, the price of British mills is understood to be about \$82.50 per ton, c.i.f. Japan, compared with the American mill quotation of \$85 to \$86 per ton, c.i.f. on light gage material. A number of small inquiries for tin plate are in the market from Japan, in most cases cannery quality being specified. The 58,000 boxes of tin plate for which the Nippon Oil Co. was recently in the market have been divided between Mitsubishi Shoji Kaisha, New York, which placed its share of the tonnage with a leading American maker and Iwai & Co., which furnished British tin plate. The price is understood to have been considerably below the present base quotation of American mills for domestic business.

American importers of steel are in some instances apparently turning their attention to agricultural steel in order to avoid the tariff. A number of inquiries for barbed wire are reported by importers from Texas and Florida. In the case of the latter state, the demand is probably the outgrowth of fence legislation in various counties, as a result of which cattle owners must fence in their property. An unusually large purchase of German barbed wire is reported to have

been made by a mail order house, for delivery to stocks at Atlantic, Pacific and Gulf ports. The price on the Atlantic Coast deliveries is understood to have been about 3c. per lb., c.i.f. Another large mail order house is reported to have been negotiating for imported barbed wire.

Inquiries for rails, on which the prospective purchaser is willing to accept foreign quotations, continue to hold the attention of importers. A recent inquiry calls for about 10,000 tons of 85-lb. sections.

To Discuss Simplification of Sizes, Types and Shapes of Grinding Wheels

A general conference of consumers, distributors, manufacturers and technical experts to consider proposals for reducing the number of sizes, types and shapes of grinding wheels in common use, and develop a unanimous simplified practice recommendation will be held in Washington, Wednesday morning, Sept. 23. The meeting is being called by the division of simplified practice of the Department of Commerce at the request of the Grinding Wheel Manufacturers Association of the United States and Canada and will take place in room 703, Department of Commerce Building.

The agenda includes consideration of grinding wheels in common use, as determined by a survey of current practice. The simplified list of sizes, types and shapes of grinding wheels, offered as a recommendation by the simplified practice committee of the grinding wheel manufacturers association, published in booklet form several months ago and abstracted in THE IRON AGE of April 30, will be discussed.

Industrial News Notes

The Bay State Collapsible Tube Corporation, Leominster, Mass., recently organized, will occupy a building formerly used by the Modern Tool & Die Co. The Bay State company will manufacture metallic tubing.

The Timken-Detroit Co. has been incorporated with \$1,000,000 capital stock, as a subsidiary of the Timken-Detroit Axle Co., Detroit, to take over the manufacturing and sales rights of the Arrow oil burner of the Socony Burner Corporation, New York, a subsidiary of the Standard Oil Co. Manufacturing arrangements will be made under the name of the Timken-Arrow oil burner.

The Dayton Fabricated Steel Co., Dayton, Ohio, has been organized to operate in a portion of the plant formerly used by the Barney & Smith Car Co., Monument Avenue, Dayton. The works will be devoted to structural steel fabrication and ornamental iron working. William H. Ortman of McGreevy & Ortman Co., Dayton is president, and R. S. Shonk, formerly manager of the Dayton Steel Construction Co., is secretary-treasurer.

The Dickerson Steel Co., First and Douglas Streets, Dayton, Ohio, recently purchased a one-story building formerly occupied by the Davis Sewing Machine Co. and used as its foundry department. The building will be used for warehouse purposes. A. V. Dickerson is president.

The Moon Motor Car Co., Philadelphia, recently organized to handle Moon and Diana automobiles, has leased a building at 4733-35 Chestnut Street, which will be used for a repair shop and distribution plant. Jay V. Thomas, formerly with the Sterling-Knight Motor Car Co., is head.

The Cutler-Hammer Mfg. Co., Milwaukee, manufacturer of electrical equipment, switches, etc., has acquired the business of Payne-Dean, Ltd., Stamford, Conn., manufacturer of signal systems, valve-control apparatus, etc. Officials of the acquired company will be connected with the purchasing organization.

The Air Reduction Sales Co., 342 Madison Avenue, New York, has purchased the assets of the Gas Tank Recharging Co., incorporated in 1913 and operating acetylene plants at Milwaukee, and Bettendorf, Iowa, and a carbide plant at Keokuk, Iowa. The Air Reduction company has 26 oxygen plants, 15 acetylene plants, 14 apparatus repair stations, 2 carbide plants, 2 calorene plants and a factory producing apparatus. In addition to these units are experimental laboratories and 148 distributing stations. The sales and service of the combined companies will be available immediately.

A substantial interest in the Servel Corporation, 17 East Forty-second Street, New York, maker of electric-operated refrigerating machinery, has been acquired by H. G. Scott, vice-president Columbia Gas & Electric Co., Charleston, W. Va. Mr. Scott will become chairman of the board and will give his entire time to the company, which, it is understood, plans to enlarge capacity.

The Standard Plumbing Supply Co., 207-209 Water Street, New Haven, Conn., has opened a new warehouse for wholesaling and jobbing in plumbers' equipment.

The Arthur C. Morse Co., 152 Temple Street, New Haven, Conn., has been organized to carry on the business of Arthur C. Morse as district representative of the Electro Dynamic Co., Electric Machinery Mfg. Co., Turbine Equipment Co., New England Roller Grate Co., Connecticut Belting Co., Stanley Belting Corporation and the Dot Lubricator Co. Mr. Morse is president.

The Pender Mfg. Co., Tarboro, N. C., recently incorporated with \$100,000 capital stock, will manufacture fertilizer distributors, continuing a business established three years ago. Plans are being made to extend distribution throughout the Northern States. The machine is made of steel and cast iron. Materials required include, castings, small steel forgings, spring wheels, cold rolled steel shafting and bolts. L. D. Pender is president.

The Columbia Refrigerator Co., manufacturer of iceless refrigerating machines, a California corporation with offices at San Francisco and factory at Stockton, is completing a new plant at Lankershim, Cal. It will include machine shops, foundry, assembly rooms, pattern storage rooms, core and show rooms and offices, and will cover an entire acre. Howard Seeley, Lankershim, is president; A. B. Cook, factory manager and vice-president; Frank J. Cornwell, secretary.

The Axelson Machine Co., Los Angeles, Cal., manufacturer of oil well pumps and sucker rods, has established a metallurgical department. The department conducts research and physical tests of steel, iron and other materials.

A consolidation has been completed between the Washington Iron Works, Los Angeles, Cal., and the West Coast Porcelain Manufacturers, Millbrae, Cal. G. B. Schneider is

general manager of the Washington works, manufacturer of sanitary ware. The Millbrae concern produces vitreous chinaware.

The Servel Corporation, 17 East Forty-second Street, New York, has acquired the entire voting stock of the Hercules Corporation, which owns plants at Evansville, Ind., Cartaret, N. J., and Newburgh, N. Y. Prior to 1921 the major field of the Hercules Corporation's activity was in farm engines, vehicles and equipment. The plant at Evansville covers about 26 acres and has handled a large business in metal and wood working. During the last ten years gross sales have averaged over \$5,800,000 yearly. During the last three years the Hercules company has been producing besides these products, refrigerators and electric refrigeration units, as well as a large number of commercial truck bodies. The present capacity of the plant is about 50,000 refrigerating machines yearly.

Industrial Finance

The M. A. Hanna Co., Cleveland, reports net profit of \$259,367 for the second quarter of 1925, compared with net loss of \$102,687 in the first quarter. There was a balance of \$154,421 after interest charges. Depreciation charges of \$238,294 and Federal taxes of \$18,000 left a net loss of \$101,880 compared with loss after interest and depreciation in the first quarter of \$418,647.

Property and good will of the Strom Ball Bearings Mfg. Co., 4527-67 Palmer Street, Chicago, have been acquired by the Marlin-Rockwell Corporation. Business of the acquired company will be conducted as before under the direction of the same personnel and department heads. The same line of bearings under the trade name, Strom, will be continued. All correspondence should be addressed to the Marlin-Rockwell Corporation, successor to Strom Ball Bearings Mfg. Co., 4535 Palmer Street, Chicago.

The Hyman-Michaels Co., Chicago, has established an office at 817 Magnolia Building, Dallas, Tex., for handling second-hand railroad equipment, rails, scrap iron, etc. J. R. Crandall, for many years connected with the St. Louis office of the company, will have charge at Dallas.

The Morrison Machine Products Co., Rochester, N. Y., manufacturer of screw machine and lathe collets, is moving to Elmira Heights, Elmira, N. Y. It will move into a new plant with facilities for doubling present capacity. D. G. Anderson is president.

Information has been received from the New Home Sewing Machine Co. that the sale of the company ordered recently was for the sole purpose of perfecting title and that the sale is a part of a reorganization plan. A syndicate has advanced \$800,000 in cash to furnish working capital for the reorganized company. W. L. Desmoyer, one of the principals, states that the organization is about completed and that the company plans an aggressive campaign of expansion.

Stockholders of the Carnegie Lead & Zinc Co., Pittsburgh, at a special meeting recently approved a change in the name of the company to the Carnegie Metals Co. and a change in capital stock to consist of 200,000 shares of \$10 par value, instead of 400,000 shares of \$5 par value. A change in name was prompted by the fact that the company no longer is a producer of lead.

The Union Metal Mfg. Co., Canton, Ohio, will move its factory to a site in Los Angeles, purchased by W. A. Porterfield, general sales manager, for the firm. The company manufactures ornamental street lighting standards and has supplied most of the lighting standards erected in Los Angeles in the past five years.

Brown, Boveri & Co. to Buy Shipbuilding Shares

The financial basis on which Brown, Boveri & Co., Ltd., the Swiss electrical manufacturing concern, will acquire control of the plant of the New York Shipbuilding Corporation at Camden, N. J., has been announced by P. A. S. Franklin, chairman of the board of the latter company. In THE IRON AGE of Aug. 13, p. 412, was an article stating that negotiations were in progress for the turning over of the shipbuilding plant to the electric manufacturing company.

The American Brown, Boveri & Co. will pay \$45 per share for the stock of the New York Shipbuilding Corporation, and of this \$30 shall be in cash and \$15 in preferred stock. These terms will be extended to all shareholders, who will receive their \$15 worth of preferred stock whether they desire to sell or not.

FABRICATED STEEL

Awards of the Week About 24,000 Tons, But a Great Deal of Work Pending

Labor Day holidays account for a slight falling-off in the volume of structural steel work placed, which totals a little less than 24,000 tons for the past week, as reported to THE IRON AGE. A good deal of work is pending and will probably be closed soon to permit work to be started this fall. The Canadian market is active, one large project on which bids will be taken this month being a bridge at Montreal, Que., totaling about 28,000 tons. Welland Canal improvements, including locks, will total about 25,000 tons, and a bridge over the Niagara River at Black Rock, near Buffalo, is expected to require fully 10,000 tons. The principal awards follow:

Apartment building, Central Park West and Sixty-first Street, New York, 1100 tons, to Levering & Garrigues Co.
Loft building, 119 West Fifty-seventh Street, New York, 500 tons, to Taylor-Fichter Steel Construction Co.
Bohack meat packing plant, Brooklyn, 300 tons, to National Bridge Works.
Baltimore & Ohio Railroad bridge, 160 tons, to American Bridge Co.
Delaware, Lackawanna & Western Railroad, bridge, 200 tons, to American Bridge Co.
Erie Railroad, bridge, 300 tons, to American Bridge Co.
Pennsylvania Railroad, bridge, 450 tons, to Bethlehem Steel Corporation.
Congress Hotel, Miami, Fla., 2200 tons, to Ingalls Iron Works, Birmingham.
Blue Heron Hotel, Palm Beach, Fla., 1500 tons, to Ingalls Iron Works, Birmingham.
Great Northern Railway, miscellaneous bridge work, 2500 tons.
Freshman dormitory, Cambridge, Mass., 350 tons, to New England Structural Co.
Floor, Watertown Arsenal, leased by Hood Rubber Co., Watertown, Mass., 200 tons, to McClintic-Marshall Co.
Garage, Boston, 200 tons, to New England Structural Co.
Ohio State Highway Commission, bridges, 400 tons, to Brookville Bridge Co.
University of Louisville, Louisville, Ky., Speed Memorial Building, 140 tons, to Louisville Bridge & Iron Co.
Rock Island Lines, four 80,000 bbl. oil-storage tanks, Eldorado, Kan., 1000 tons, to Chicago Bridge & Iron Works.
Ascher-Sheridan Road Theater, 550 tons, to McClintic-Marshall Co.
Florida East Coast Railway, St. Augustine, Fla., coach shop, 700 tons, to Virginia Bridge & Iron Co.
Street railroad bridge, Milwaukee, Wis., 400 tons, to Milwaukee Bridge & Iron Co.
American Smelting & Refining Co., Garfield, Utah, 500 tons, to Minneapolis Steel & Machinery Co.
Medical Arts Building, Denver, Colo., 2200 tons, to R. Burkhardt & Sons.
Avalon Theater, Chicago, 780 tons, to Vanderkloot Steel Works.
Gas holder, 600 tons, to Stacy Brothers Gas Construction Co.
Olequa toll bridge, Olequa, Wash., 188 tons, to Wallace Equipment Co.
Apartment building, Clay and Powell Streets, San Francisco, 150 tons, to Golden Gate Iron Works.
Olympic-Calpet Refining Co., Smith Cove, Seattle, Wash., 16 small tanks, 500 tons, to Puget Sound Machinery Depot.
Shell Oil Co., Los Angeles, 100 tons, to Lacy Mfg. Co.
Kier Fire Brick Co., Salina, Pa., addition, 225 tons, to Jones & Laughlin Steel Corporation.
Michigan Central bridges, 670 tons, to American Bridge Co.
Morrow Street power house, Detroit, 4000 tons, to Massillon Bridge & Structural Co.
Grand Trunk Railroad bridge work, 180 tons, to Massillon Bridge & Structural Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Bridge at Luzerne Street, Philadelphia, 200 tons.
Office building, Providence, R. I., 300 tons.

Bridge work at Greenboro, N. C., 400 tons.
Power plant, Beaumont, Texas, Stone & Webster, builders, 500 tons.
Erie Railroad, bridge, 250 tons.
Central Railroad of New Jersey, bridge at Bayonne, N. J., 1200 tons.
Harvard Business School, Cambridge, Mass., 1500 tons.
Pennsylvania Railroad, bridge, 250 tons.
Trust & Deposit Co., Syracuse, N. Y., 200 tons.
Highway bridge, Williamsport, Pa., 200 tons.
Savoy Hotel, Fifth Avenue and Fifty-ninth Street, New York, 8000 tons.
Fox Film Corporation, building on West Forty-fourth Street, New York, 300 tons.
Knickerbocker Building, Convent Avenue and 131st Street, New York, tonnage not stated.
C. E. Mitchell, residence at 934 Fifth Avenue, New York, 200 tons.
Apartment building, Fifth Avenue and Ninety-fourth Street, New York, 1000 tons.
Synagogue, West Ninety-fifth Street, New York, 300 tons.
Ocean Avenue telephone building, Brooklyn, 300 tons.
Gym and indoor field, Lewiston, Me., 250 tons.
Municipal building, Waltham, Mass., 100 tons.
High school, Pawtucket, R. I., 800 tons.
Business block, Manchester, N. H., 100 tons.
Central fire station, Boston, 440 tons.
Hotel, St. Louis, 600 tons.
Colored Knights of Pythias, Chicago, building, 1500 tons.
Illinois Central Grant Park, Chicago, seven bridges, 1600 tons; Avery Brundage, Chicago, low bidder.
Standard Oil Co. of California, San Francisco, 150 tons; bids in.
South San Joaquin Irrigation District, Manteca, Cal., spillway gates, 500 tons; bids close Sept. 22.
Masonic Temple, Portland, Ore., 500 tons; bids in.
Bridge across Pyallup River on State road No. 5, near Tacoma, Wash., 167 tons; bids close Sept. 15.
Y. W. C. A. building, Buffalo, 400 tons.
South Shore Bridge, Montreal, Que., 28,000 tons; bids to be taken this month.
Welland Canal, new locks, 25,000 tons.
Black Rock Bridge over Niagara River, near Buffalo, 10,000 to 15,000 tons.

RAILROAD EQUIPMENT

Baltimore & Ohio Inquires for 1000 Hopper Car Bodies—250 Box Cars Bought

Inquiries for railroad equipment are very light, the largest in the market being for 1000 hopper car bodies for the Baltimore & Ohio Railroad. A Southern road has ordered 250 box cars. The Great Northern ordered 500 Ballast cars.

August shipments of railroad locomotives were 104, as compared with 66 in July and 139 in August, 1924, according to reports filed with the Department of Commerce. The total for the year to date of both domestic and foreign engines is 752 as compared with 1916 in the first eight months of 1923 and 990 in the corresponding period in 1924.

Freight cars in need of repair on Aug. 15 totaled 195,271 or 8.4 per cent of the number on line, according to reports of the Car Service Division, American Railway Association. This was a decrease of 2010 as compared with Aug. 1. Locomotives in need of repair Aug. 15 totaled 10,920, an increase of 262 over the Aug. 1 report.

The principal items of the week follow:

The Georgia, Florida & Alabama Railroad has ordered 250 box cars from the General-American Car Co.
The Baltimore & Ohio Railroad is in the market for 1000 hopper car bodies.
The Seaboard Air Line has ordered 10 locomotives from the Baldwin Locomotive Works.
Orders for mine cars have been received by the American Car & Foundry Co. from the following companies: Ebbw Vale Coal Co., 25; Templeton Coal Co., 20; Pennsylvania Coal Co., 15 mine car bodies.
The Great Northern has ordered 500 50-ton multi-service ballast cars from the Bethlehem Steel Corporation.

Iron and Steel Markets

FIRST RAIL BUYING

Mill Operations and Prices Well Maintained

Above 75,000 Tons of Structural Steel for Canada—Large Pig Iron Contracts

September thus far has duplicated in nearly every particular the steel market features of the second half of August. One variation is the beginning of rail buying. Lines which led off last year in early August have closed for 80,000 tons in the past few days and pending inquiries represent 30,000 tons more.

Some producing interests are putting stress on the scale of the continuing demand for plates, shapes and bars, especially bars, and on reports of the firmer attitude of sellers of this product. With a number of mills bar bookings of late have exceeded shipments. Generally speaking, however, the maintenance of present volume and prices is indicated for the immediate future, rather than any notable change in either.

Labor Day cut down this week's steel output somewhat, but the Steel Corporation's scheduled rate is still 75 per cent, while Pittsburgh, Youngstown, Cleveland, Buffalo and Chicago independents average slightly above 70 per cent.

A Pittsburgh independent company has started another blast furnace and the Carnegie Steel Co. will add one Edgar Thomson furnace to the active list next week. A Steelton, Pa., furnace has just gone in.

Structural mills will be called on shortly to roll some large tonnages for Canada. Bids will be opened this month for the South Shore bridge at Montreal, 28,000 tons, and lock gates for the Welland Canal will take 25,000 tons. Canadian fabricators have booked lately about 25,000 tons of power house and transmission tower work, for which the steel will be placed with mills here. Another large project soon to come up is the Black Rock bridge over the Niagara.

The chief structural item is 8000 tons for a Fifth Avenue hotel, New York. Awards in a short week were about 24,000 tons.

Surprisingly low bids were brought out by some of the largest of recent fabricating awards, competition being especially severe on two or three important Eastern jobs.

Apart from rails, railroad buying is not impressive. The largest inquiry is for 1000 hopper car bodies for the Baltimore & Ohio. The Great Northern has ordered 500 ballast cars and the Georgia, Florida & Alabama, 250 box cars. Builders refer to expected inquiries for a total of more than 300 locomotives.

With the slowing down of drilling since the break in oil and gasoline prices, the demand for oil well pipe and supplies has fallen off somewhat. Argentine Government oil fields are about to buy 8000 tons of 4-in. to 16-in. oil well casing.

In a pig iron market otherwise quiet, the buying of several large interests stands out. The American Radiator Co.'s total, as given officially, was around 40,000 tons. An eastern Pennsylvania steel company has just bought 30,000 tons of basic for fourth quarter. A pipe company has taken upward of 40,000 tons for fourth and first quarters and a group of malleable foundries in the Middle West, 20,000 tons. For the basic iron \$20.50, delivered, was paid, and for part of the pipe iron the basis was \$18, Birmingham.

Thus far the anthracite strike has produced little activity in coke or in bituminous coal. For 10,000 tons of September and 20,000 tons of October blast furnace coke \$3.40 was paid, though \$3.75 has been asked. Some bituminous coal has sold at an advance of 10c. New England demand is much increased.

The possibility of an advance in pig iron due to higher fuel has been recognized for some time. Thus far one sliding scale contract for blast furnace coke has been advanced 50c.

German strategy in international steel trade is indicated in our cable this week. Consolidation of operations, to allot orders to lowest cost plants, is under negotiation by Krupp with the Phoenix Co., Haniel & Lueg, Rhine-Elbe Union and Rhenish Steel Corporation. Merger in a trust is a possibility.

No change is made in either of THE IRON AGE composite prices this week, pig iron remaining at \$19.13 per ton and finished steel at 2.396c. per lb. Pig iron is 33c. below last year and \$6.16 below 1923; finished steel is \$2 per net ton below last year and \$7.58 lower than two years ago.

Pittsburgh

Sustained Buying of Steel—Pig Iron Output Increased—Prices Strengthening

PITTSBURGH, Sept. 8.—Steel business in the Pittsburgh district holds up well in volume despite the continued absence of any important railroad buying, and while there is no formal effort on the part of buyers to anticipate their requirements, incoming orders for bars are running ahead of shipments and give the manufacturers longer rolling mill schedules than is possible with any of the other finished lines. In a general way, the heavy tonnage products—plates, shapes and bars—are being booked in somewhat greater volume than was the case recently, and last week's business in these lines of one large company was the second largest of any similar period in its history.

The bulk of the business still calls for early delivery. There is little fear on the part of consumers that they will be unable to obtain supplies in such volume and as promptly as wanted, and consequently

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Sept. 8, 1925	Sept. 1, 1925	Aug. 4, 1925	Sept. 9, 1924
No. 2X, Philadelphia...	\$21.76	\$21.76	\$21.26	\$21.76
No. 2, Valley furnace...	18.50	18.50	18.50	20.00
No. 2, Southern, Cin'tl...	22.55	22.55	22.55	21.55
No. 2, Birmingham, Ala...	18.50	18.50	18.00	17.50
No. 2, foundry, Ch'go furn...	20.50	20.50	20.50	20.50
Basic, del'd, eastern Pa...	20.50	20.50	20.50	20.00
Basic, Valley furnace...	18.00	18.00	18.00	19.00
Valley Bessemer del'd P'gh	20.76	20.76	20.76	21.76
Malleable, Chicago furn...	20.50	20.50	20.50	20.50
Malleable, Valley	18.50	18.50	18.50	20.00
Gray forge, Pittsburgh...	19.76	19.76	19.76	21.26
L. S. charcoal, Chicago...	29.04	29.04	29.04	29.04
Ferromanganese, furnace...	115.00	115.00	115.00	95.00

Rails, Billets, etc., Per Gross Ton:	Sept. 8, 1925	Sept. 1, 1925	Aug. 4, 1925	Sept. 9, 1924
O.-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh...	35.00	35.00	35.00	37.00
O.-h. billets, Pittsburgh...	35.00	35.00	35.00	37.00
O.-h. sheet bars, P'gh...	35.00	35.00	35.00	37.50
Forging billets, base, P'gh	40.00	40.00	40.00	42.00
O.-h. billets, Phila...	40.30	40.30	40.30	42.17
Wire rods, Pittsburgh...	45.00	45.00	45.00	46.00
Skelp, gr. steel, P'gh, lb...	1.90	1.90	1.90	2.00
Light rails at mill...	1.60	1.60	1.60	1.85

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.17	2.32
Iron bars, Chicago...	1.90	1.90	1.90	2.15
Steel bars, Pittsburgh...	1.90	1.90	2.00	2.10
Steel bars, Chicago...	2.10	2.10	2.10	2.00
Steel bars, New York...	2.24	2.24	2.34	2.44
Tank plates, Pittsburgh...	1.80	1.80	1.90	1.80
Tank plates, Chicago...	2.10	2.10	2.10	2.10
Tank plates, New York...	2.14	2.14	2.14	1.99
Beams, Pittsburgh	1.90	1.90	2.00	2.00
Beams, Chicago	2.10	2.10	2.10	2.10
Beams, New York	2.24	2.24	2.24	2.34
Steel hoops, Pittsburgh...	2.40	2.40	2.40	2.60

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	Sept. 8, 1925	Sept. 1, 1925	Aug. 4, 1925	Sept. 9, 1924
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.15	3.15	3.15	3.50
Sheets, black, No. 28, Chi-				
cago dist. mill...	3.30	3.30	3.30	...
Sheets, galv., No. 28, P'gh	4.20	4.20	4.20	4.60
Sheets, galv., No. 28, Chi-				
cago dist. mill...	4.35	4.35	4.30	...
Sheets, blue, 9 & 10, P'gh	2.25	2.25	2.30	2.70
Sheets, blue, 9 & 10, Chi-				
cago dist. mill...	2.40	2.40	2.40	...
Wire nails, Pittsburgh...	2.65	2.65	2.65	2.80
Wire nails, Chicago dist.				
mill	2.70	2.70	2.70	...
Plain wire, Pittsburgh...	2.50	2.50	2.50	2.55
Plain wire, Chicago dist.				
mill	2.55	2.55	2.55	...
Barbed wire, galv., P'gh...	3.35	3.35	3.35	3.50
Barbed wire, galv., Chi-				
cago dist. mill...	3.40	3.40	3.40	...
Tin plate 100-lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:

Heavy steel scrap, P'gh...	\$19.00	\$19.00	\$18.50	\$17.50
Heavy steel scrap, Phila...	17.50	17.00	16.00	17.00
Heavy steel scrap, Ch'go...	16.75	16.75	16.25	16.50
No. 1 cast, Pittsburgh...	17.50	17.50	17.50	18.00
No. 1 cast, Philadelphia...	18.00	18.00	18.00	18.00
No. 1 cast, Ch'go (net ton)	18.00	18.00	17.50	18.50
No. 1 RR. wrot., Phila...	17.50	17.50	17.50	19.00
No. 1 RR. wrot. Ch'go (net)	16.25	16.75	15.00	15.00

Coke, Connellsville,

Per Net Ton at Ovens:

Furnace coke, prompt...	\$3.40	\$3.40	\$2.90	\$3.00
Foundry coke, prompt...	4.50	4.00	3.75	4.00

Metals,

Per Lb. to Large Buyers:

Lake copper, New York...	14.87 1/2	14.75	14.62 1/2	13.50
Electrolytic copper, refinery	14.50	14.37 1/2	14.37 1/2	13.12 1/2
Zinc, St. Louis	7.72 1/2	7.57 1/2	7.50	6.15
Zinc, New York	8.08 1/2	7.92 1/2	7.85	6.50
Lead, St. Louis	9.25	9.50	8.90	7.95
Lead, New York	9.60	9.85	9.00	8.10
Tin (Strait), New York	57.75	56.62 1/2	59.25	51.12 1/2
Antimony (Asiatic), N. Y.	17.12 1/2	17.00	17.75	11.00

THE IRON AGE Composite Prices

Sept. 8, 1925, Finished Steel, 2.396c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.	One week ago,	2.396c.
	One month ago,	2.439c.
	One year ago,	2.496c.
	10-year pre-war average,	1.689c.

Sept. 8, 1925, Pig Iron, \$19.13 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.	One week ago,	\$19.13
	One month ago,	19.00
	One year ago,	19.46
	10-year pre-war average,	15.72

High	Low
1923 2.824c., April 24 \$30.86, March 20	1925 2.396c., Aug. 18 \$18.96, July 7
1924 2.789c., Jan. 15 \$22.88, Feb. 26	1924 2.460c., Oct. 14 \$19.21, Nov. 3
1925 2.560c., Jan. 6 \$22.50, Jan. 13	1923 2.446c., Jan. 2 \$20.77, Nov. 20

they are not disposed to abandon the policy of frequent small purchases as required.

The railroads hold out the only real promise of a substantial gain in consumption, although there is the possibility of a further slight increase in the activities of the agricultural implement industry. In considering the prospect, however, steel manufacturers are impressed by the fact that the latter industry already is enjoying good business as compared with recent years. The oil industry usually does less drilling during winter months than in other seasons of the year and may be expected to be a smaller buyer of oil well supplies than it has been in the past few months. The

outlook is for a sustained demand for structural steel and reports about the sale of automobiles indicate that motor car builders will continue to be rather good buyers over the remainder of the year. It is hard to find any steel manufacturers who do not expect railroad buying to improve materially in the next thirty days and the general business prospect is regarded favorable enough for most companies to be enlarging their operating schedules.

The Jones & Laughlin Steel Corporation late last week put on another blast furnace at its Aliquippa works and now has all five stacks at that plant and nine of its 12 furnaces in production. The Carnegie

Steel Co. has put on one of its Carrie furnaces, and while one of the same group will be blown out this week, an Edgar Thomson furnace will be started soon, probably next week. The Steel Corporation's ingot production in this and nearby districts is about 75 per cent of capacity while an average of active independent capacity is slightly above 70 per cent.

There is no change in steel prices as compared with a week ago, but if anything, the market reflects a firmer stand on the part of producers. Sales resistance at today's price levels is slight and there is therefore greater appreciation by manufacturers that price cutting does not create business. Actual requirements of steel are large enough to keep orders flowing in very steadily, and there is not only that factor, but also a very narrow margin between costs and present selling prices to encourage some price firmness.

Scrap and pig iron are holding up in price in spite of a very slow demand and suggestions of an early advance in pig iron are more commonly heard. The effort of coke producers to profit by the hard coal mine suspension has not yet been attended by much success. They are asking as much as \$4 for furnace coke for spot shipment, but only small and inconsequential sales have been made at higher than \$3.40. Blast furnaces now in operation and using beehive oven coke are covered by contracts and there are no suggestions that any idle furnaces which usually smelt pig iron with that kind of coke will start up in the near future. Much has been said about the possibility that independent Connellsville district operators would have to raise wages in order to secure working crews in competition with the H. C. Frick Coke Co., which is paying a much higher scale than the independents, but no such trouble has beset independent operations, which recently have resumed chiefly because the Frick company could not provide work for all the men available in the district.

Pig Iron.—The National Malleable & Steel Casting Co. has just closed for 2000 tons of basic iron for delivery at Sharon, Pa., paying \$18, Valley furnace. A sale of 500 tons of Bessemer iron at \$19, Valley furnace, also is noted, but with these exceptions the business of the week has run to small tonnages and the total business of the week does not bulk large. The market is remarkable more for its firmness than for its activity. This region at the moment seems to be the duller and lowest of any in the country. Melter in the Pittsburgh district are not very well supplied with business and are amply protected so far as pig iron supplies are concerned against rather full consumptive requirements over the remainder of the year. With outside centers on a higher price level than Pittsburgh, it is probable that Valley furnaces more and more will seek business outside because of better net returns than are possible on shipments to Pittsburgh. In this connection a hearing is to be given Mahoning Valley furnaces by the railroad interests at the Pittsburgh Chamber of Commerce next Monday morning on a demand for a downward revision of freight rates that will place furnaces in that area on a parity with Youngstown and Cleveland on iron shipments to eastern and central Ohio points. As announced in THE IRON AGE several weeks ago, the Ohio State Public Utilities Commission ordered a reduction in freight rates on pig iron from Cleveland to Canton of from \$1.76 per ton to \$1.26, to match the rate of \$1.26 to Youngstown. Operators of furnaces in the Mahoning Valley contend that they should not be penalized to the extent of 50c. a ton on shipments to Canton and adjacent territories.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$18.00
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	18.50
Low phosphorus, copper free.....	\$27.75 to 28.00

Ferroalloys.—This market still is a slow affair. Steel makers are fairly well stocked with ferromanganese and their purchases now are only in such lots as will maintain reserves at a safe level. The published

price is well observed, although there are suggestions of slight concessions. A sale of 300 tons of spiegel-eisen to a local maker of steel mill rolls for shipment over the remainder of the year at \$32, furnace, for 20 per cent material is the only sizable sale of that alloy recently reported. Consumers are specifying fairly steadily against contracts for 50 per cent ferrosilicon, but there is almost no new business. Prices are given on page 721.

Semi-Finished Steel.—Mills in this district are holding firmly to \$35, Pittsburgh or Youngstown, for sheet bars and that also is their idea of price on billets and slabs. Youngstown mills have a price of \$35 for sheet bars and small billets, but on large billets and slabs they are quoting \$33.50. In the latter case, however, the price seems to be strictly f.o.b. Youngstown, as efforts of local consumers to obtain that price f.o.b. Pittsburgh have not been successful. There is very little open market activity in these forms of steel because practically all nonintegrated steel makers have regular sources of supply and do not have to supplement supplies coming to them on contracts. Mills that are occasional sellers of sheet bars do not appear to be reaching out for business, chiefly because they cannot make and sell them profitably below \$35, Pittsburgh. This is a helpful influence in sustaining prices. Specifications and orders for wire rods are flowing in steadily; prices are steady at \$45, base, Pittsburgh or Cleveland. Prices are given on page 721.

Wire Products.—Orders of local mills, especially for manufacturers' wire, still are growing and in that product there are some makers who are finding some trouble in keeping abreast of the deliveries expected by customers. Nails and other products marketed through jobbers are moving very steadily and there is expectation that this will be the case throughout the fall, as the outlook is for a good fall consumption, and it is believed that the jobbers have pretty well liquidated their heavy takings of the fore part of the year. Mills still complain that prices show little if any profit, but signs of an advance are lacking. Outside of one or two districts to the West, the market is pretty well established at \$2.65, base, per keg, Pittsburgh or Cleveland, for nails, and \$2.50, base, per 100 lb. for plain wire, these prices, of course, subject to freight equalization into competitive areas. Prices are given on page 720.

Tubes.—The method of quotation of seamless mechanical tubing announced by the National Tube Co. early last July has been adopted by independent makers and there is now no quoting of the old list and discounts. Seamless mechanical tubing is finding very steady demand, notably from the automotive industry. In boiler tubes, both seamless and welded, the situation leaves something to be desired. There is not enough business to give all makers a share and competition for passing business is keen. The supplementary discounts on the sizes 4 in. and larger of lapweld steel tubes bring the actual discount to about 60 per cent, instead of 46 per cent, the card rate. Discounts are given on page 720.

Cold Finished Steel Bars and Shafting.—Consumers and distributors continue to purchase close to their actual requirements, but evidently consumption is still high because the orders and specifications are coming along with remarkable constancy and the volume is gradually growing. Except for the fact that it is impossible to accumulate any backlog business and that mill scheduling is almost on a daily basis, the market is fairly satisfactory. There is a good deal of capacity in relation to consumption and with real requirements the gage of buying, present demands are not taxing the ability of manufacturers. Prices are steady with 2.50c., base, Pittsburgh, the ruling one on ordinary tonnages.

Hot-Rolled Flats.—Buyers are not anticipating their requirements, but evidently they have growing needs since August orders of makers in this district ran well ahead of those for July and this tendency continues this month, with total bookings running somewhat ahead of the same period in August. Mills have to be scheduled with a good deal of frequency, but manufacturers are growing accustomed with this condition, which has been

a common one since the fore part of the year. Prices are holding firmly at 2.20c., base, Pittsburgh for material wider than 6 in. and at 2.40c., base, Pittsburgh, for the narrower sizes. Prices are given on page 720.

Cold-Rolled Strips.—There is a good business in this line, although it is the frequency, rather than the size, of the individual orders that gives satisfaction. Buyers still gage purchases by their actual requirements, but an increase in the number of purchases indicates that requirements are growing. The automobile industry is still the chief source of outlet, but there is constant buying by makers of builders' hardware and office equipment. The market is called firm at 3.75c., base, Pittsburgh or Cleveland.

Bolts, Nuts and Rivets.—Actual requirements of bolts and nuts are gaining and measured by shipments, makers in this district are doing the best business since the fore part of the year. Prices are firm. The rivet market is weak. Prices and discounts are given on page 721.

Makers in this district this week are opening their books for fourth quarter business at unchanged prices.

Steel and Iron Bars.—There is still a brisk demand for steel bars, and while the bulk of the business still calls for early delivery, some makers find shipments to be falling behind new business, and some piling up of orders is the result. There is no change in the price situation, with 2c. the ruling price on small tonnages and 1.90c. on sizable lots. It takes a more attractive tonnage to bring out the latter figure, however, than was the case a short time ago. Iron bars are steady in price, but are not especially active. Prices are given on page 720.

Structural Material.—Fabricated steel business in this immediate territory is not very heavy, but it is good in other parts of the country, and the mills are getting fairly liberal releases and specifications against contracts. There is no change in prices. The volume of structural steel up for prices is very large for the time of year. Since building construction no longer is strictly seasonable, it is commonly believed that a large percentage of the projects pending will be placed. Plain material prices are given on page 720.

Plates.—There is only a fair demand for this product, but a fairly steady stream of small tonnages is keeping mills in this district reasonably well employed. Although there is a good deal of capacity that cannot be operated profitably at present prices, it is noted that there is still a good deal of competition for passing business. Eastern mills are especially eager for orders. Prices are given on page 720.

Rails and Track Supplies.—Standard rail orders for 1926 are slow in making their appearance, and there are few railroads over the Eastern half of the country which seem to have underestimated their 1925 requirements. The market also is quiet on rail accessories, but the common expectation is that there will be a good deal of ordering of both rails and accessories in the next 30 or 45 days. Closing down of the anthracite mines has cut off light rail business from that source, and the brighter prospects for soft coal mine operations have yet only resulted in a somewhat larger inquiry from that direction. Light rail prices are very low as compared with recent years, but that fact is not interesting to those whose requirements are lighter than usual. Prices are given on page 720.

Pipe.—There is still a good business in pipe, although slowing-down of oil well drilling because of the break in oil and gasoline prices has meant some falling-off in demand for oil country goods. Standard pipe is moving very steadily because jobbers had let their stocks run down pretty low and now find it impossible to meet demands without fresh supplies from the mills. Discounts are given on page 720.

Sheets.—Demand is steadily expanding but buyers still are holding to the policy of buying close to their real requirements. Needs run to good volume in automobile body sheets and also in galvanized sheets, prices of which are now notably firm. Lately prices below 4.20c. on galvanized sheets have disappeared. Sales of black sheets still are reported at 3.10c., base, but it is said that such business usually refers to tin mill gages for stove pipe, enameling stock and for full

finished sheets—all carrying extras that yield a better net price than 3.15c., base, on ordinary black sheets. A good volume of blue annealed sheet business is coming to the mills, and the ruling prices are 2.25c. to 2.30c., base. There is still a good deal of plate mill competition on the heavy gages, but at 1.80c., base, for plates, No. 10 gage sheets rolled on a plate mill would cost buyers close to 2.10c. Prices are given on page 720.

Tin Plate.—This season usually sees some falling away in the demand, and this year is no exception to the rule. Container manufacturers succeeded in getting the mills to speed up production and shipments against contracts, and also bought liberally of stock items, with the result that they are now well fortified against the food can requirements. There is not the recent rush for shipments, but if frosts hold off long enough there is a possibility of a fairly good business in the next sixty days. The price situation is without change.

Coke and Coal.—Connellsville beehive oven coke producers are generally asking \$3.75 and in some instances \$4 per net ton at ovens for spot furnace coke. But have succeeded in selling only a few carloads at the lower figure, and then for some other purpose than the smelting of pig iron. Two Eastern pig iron producers, impressed by the possible effect of the hard coal mine tie-up a few weeks ago, covered for their fourth quarter requirements at \$3.50 and \$3.75. But the only other business reported for blast furnace use is that of the local steel company, which, it develops, bought 10,000 tons for September delivery and 20,000 tons for October delivery at \$3.40. With no furnaces going into blast that usually operate on beehive oven coke and with furnaces already in blast covered by contract at lower prices, the possibility of furnace coke selling up to present asking prices seems a little remote. As there is a wage scale clause in the contracts, furnace interests would be obliged to pay from 75c. to \$1 a ton above the contract price in the event that the independent wage scale was advanced to that of the H. C. Frick Coke Co. Foundry coke is stronger because of larger takings against contracts and some buying for stock. Coal prices are slightly firmer due to heavier demands incident to the anthracite suspension. Prices are given on page 721.

Old Material.—The market here is very quiet so far as consumer buying is concerned, but there is no occasion to change prices materially, as offerings are moderate and there is not much pressure to sell. Based on consumers' bids, the market is weaker on machine shop turnings and cast iron borings, but with dealers short of the market paying \$15 and even \$15.25 to cover, there is little chance for consumers to get supplies for less. One user of heavy melting steel of No. 1 railroad classification or its equivalent probably would take on a tonnage at today's prices, but dealers seem unwilling to sell that kind of material at less than \$20. Railroad steel scrap this month is bringing \$19.25 to 19.50, Pittsburgh, and the lists are light. There is only 1115 gross tons in the Norfolk & Western list, which closes Sept. 11.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel	\$19.00 to \$19.50
No. 1 cast, cupola size	17.50 to 18.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md., Huntington, W. Va., and Franklin, Pa.	20.50 to 21.00
Compressed sheet steel	17.50 to 18.00
Bundled sheets, sides and ends ..	16.50 to 17.00
Railroad knuckles and couplers ..	21.00 to 21.50
Railroad coil and leaf springs ..	21.00 to 21.50
Low phosphorus blooms and billet ends	23.00 to 23.50
Low phosphorus plate and other material	21.50 to 22.00
Railroad malleable	19.00 to 19.50
Steel car axles	21.00 to 21.50
Cast iron wheels	17.50 to 18.00
Rolled steel wheels	21.00 to 21.50
Machine shop turnings	15.00 to 15.25
Short shoveling turnings	15.00 to 15.25
Sheet bar crops	20.00 to 20.50
Heavy steel axle turnings	17.00 to 17.50
Short mixed borings and turnings ..	14.00 to 14.50
Heavy breakable cast	16.50 to 17.00
Stove plate	14.00 to 14.50
Cast iron borings	15.00 to 15.25
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	19.00 to 19.50

Chicago

Large Steel Bookings—Sustained Operations—Firm Pig Iron

CHICAGO, Sept. 8.—A gradual and healthy improvement in industrial activity is indicated by the fact that new business taken by steel mills was heavier during the past week than for any similar period since early in March, with the exception of the last week in July. At the same time specifications to the mills are in greater volume than for any period since the first part of April. Structural lettings have been more liberal, showing a decided increase over the previous week. Structural bookings at mills are highest since the first of the year, the tonnage being about equally divided between building construction and car materials. Bar mills continue to operate at a good rate, due partly to the activities of farm implement and automobile part manufacturers and also to the continued demand for reinforcing bars. It is estimated that there will be fully 30,000 tons of reinforcing bar material placed in the near future. The price situation is still well maintained in the local market, although competition in the outlying districts is severe.

The leading interest continues to operate at 75 per cent of ingot capacity and the foremost independent 80 per cent. Steel works blast furnace operations are unchanged for the week. The present volume of business from the industrial field is satisfactory and it apparently remains only for the railroads to begin buying in order that a stronger market condition may be established. August earnings of the railroads were favorable, and it is generally believed that expected continued improvement in earnings will soon bring the roads actively into the market.

The scrap market has been quiet with an apparent tendency towards weakness. Pig iron, on the other hand, is gradually becoming firmer, due, at least in part, to the coal strike situation. A change in the price of coal will be felt in the cost of coke production and ultimately this change may be reflected in the sales price of pig iron.

Pig Iron.—Sales of Northern foundry have been about equal to those of the previous week. The attitude of buyers is shown by the fact that orders are generally for small tonnages and either for immediate requirements or for coverage up to the first of the year. A few inquiries are reported for the first quarter. It is reported that in some instances quotations are being made for acceptance a short time ahead of the date of quotation, a fact pointing to possible advances before very long. An Indiana melter is in the market for 800 tons of foundry iron. A northern Illinois user has closed his requirements for the year by purchasing 4000 tons of foundry. One order has been placed for 3000 tons of malleable. One hundred fifty tons of charcoal iron was sold at \$29.04, delivered Chicago, this being the usual quotation. Both silvery and Southern iron appear firm. A local user has inquired for 500 tons of ferrosilicon, 10 to 11 per cent.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 51c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	\$20.50
Northern No. 1 foundry, sil. 2.25 to 2.75	21.00
Malleable, not over 2.25 sil.	20.50
High phosphorus	20.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (all rail)	\$23.51 to 24.51
Southern No. 2 (barge and rail)	22.68
Low phos., sil. 1 to 2 per cent, copper free	31.20
Silvery, sil. 8 per cent.	30.29 to 30.79
Ferrosilicon, 14 to 16 per cent.	44.00 to 44.50

Plates.—The Great Northern has placed an order with the Bethlehem Steel Corporation for 500 50-ton multi-service ballast cars, calling for about 5000 tons of steel. The Baltimore & Ohio is making inquiry for

1000 car bodies. An inquiry is reported for 150 poultry cars, requiring 1000 tons. One local producer has booked 5000 tons of tank steel for points in Texas and the West. It is estimated that fully 12,000 tons of tank steel will be placed in the near future. The price of plates is firm at 2.10c., Chicago.

The mill quotation is 2.10c., Chicago. Jobbers quote 3.10c. for plate out of stock.

Ferroalloys.—A few carlot sales of ferromanganese show no change in price. One carlot of spiegeleisen was sold at \$35, Jackson County furnace, or \$40.04 delivered, Chicago.

We quote 80 per cent ferromanganese, \$122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, \$85, delivered; spiegeleisen, 18 to 22 per cent, \$39.76 to \$40.04, delivered.

Bars.—Specifications to the mills are the best since April 1, and the volume of new business during the past week has been better than for any week since March 1, excepting that of July 27. The railroads are still holding out of the market, although there is every indication that it will not be long before they will resume buying. Farm implement manufacturers remain on a high productive basis and the automobile part makers are producing at full capacity or better. Rail steel bars are still in exceptionally good demand.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 1.90c. to 2c., Chicago; rail steel, 2c., Chicago and 2c., mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.60c. for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

Structural Material.—Inquiries have shown an increase and specifications to the mills are in excess of any period since early in the spring. Orders are about equally divided between building construction and car materials. Altogether the prospects for a good fall business appear to be favorable. Service from local producers is still on a satisfactory basis. One of the largest inquiries of the week was that of the Great Northern for 3000 tons of plates and shapes for girder and truss type bridges.

The mill quotation on plain material is 2.10c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Wire Products.—The past week has shown a slight improvement in both specifications and contracting. The mills are still operating at a rate approximately equal to demand and mill stocks have been lowered slightly during the week. Retail stocks are reported low and there appears to be no noticeable effort to build them up. Mill prices, which are unchanged, are shown on page 720.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.05 per 100 lb.; common wire nails, \$3.15 per keg; cement coated nails, \$2.15 to \$2.20.

Sheets.—Demand remains steady with specifications and orders being received at about the same rate at which shipments are made. Local prices are unchanged.

Chicago delivered prices from mill 3.35c. to 3.40c. for No. 28 black, 2.45c. to 2.50c. for No. 10 blue annealed and 4.40c. to 4.45c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.50c. base for blue annealed, 4c. base for black, and 5c. base for galvanized.

Cast Iron Pipe.—Bids taken on 1140 tons of 8-in. class B pipe for Chicago, were as follows: James B. Clow & Sons was the successful bidder with \$41.55, figured back to Birmingham base; American Cast Iron Pipe Co. quoted \$42 base and the United States Cast Iron Pipe & Foundry Co. bid \$42.25. Mundelein, Ill., will not open bids until Sept. 10 on its inquiry for 454 tons. Birmingham, Mich., is making inquiry for 300 tons of 6-in. and 8-in., class B. On the general run of business, ruling quotations on pipe range from \$41 to \$42, base Birmingham, for 6-in. and larger sizes. With

pipe foundries operating full there is a tendency toward the higher figure.

We quote per net ton f.o.b. Chicago, as follows:
Water pipe, 4-in., \$53.20 to \$54.20; 6-in. and over, \$49.20 to \$50.20; Class A and gas pipe, \$4 extra.

Rails and Track Supplies.—Purchases by the railroads are still not in evidence although there is some indication that they will soon be in the market. A local producer has booked 1000 tons of light rails.

Bolts, Nuts and Rivets.—The first week in September has brought about no change in the volume of bolt and nut specifications, this condition warranting a continuation of output at 65 to 70 per cent. Fourth quarter contracting has opened up and the discounts on bolts and nuts are steady. Large rivets are stronger, with most makers quoting \$2.65, Chicago, and no transactions at less than \$2.60 reported. On small rivets 70, 10 and 10 off Chicago, is now an open quotation. For mill prices see page 721.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to $\frac{3}{4}$ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to $\frac{3}{4}$ x 4 in., 50 off; larger sizes, 50 off; hot-pressed nuts, squares, tapped or blank, \$3.50 off; hot-pressed nuts, hexagons, tapped or blank, \$4 off; coach or lag screws, 60 per cent off.

Reinforcing Bars.—No outstanding awards have been made during the week. Lettings, however, are large in the aggregate, and tonnage still pending is heavy. Billet steel reinforcing bars remain steady at 2.60c., Chicago warehouse. Lettings include:

Kausal apartment hotel, Chicago, 110 tons of rail steel, to Inland Steel Co.

Public school, Carmen and Kenneth Avenues, Chicago, 160 tons, to Calumet Steel Co.

St. Joseph Nurses' Home, St. Paul, 150 tons, to C. A. T. Turner Co., St. Paul.

Portland Cement Association building, Chicago, 125 tons, to Kalman Steel Co.

Y. M. C. A. building, Milwaukee, Wis., 100 tons, to Kalman Steel Co.

Pending work includes:

Seven bridges over the Illinois Central tracks, Grant Park improvement, Chicago, South Park Board, 450 tons.

North side sewage treating plant, Niles Center, Ill., 400 tons, Sanitary District, Chicago.

Hirsch junior high school, Chicago, 600 tons, general contract to Paschen Brothers.

Old Material.—The market has been quiet, with a tendency toward weakness. Most purchases are confined to carloads for small consumers, who are still pursuing the policy of hand to mouth buying. Consumer inquiries, however, are in encouraging volume. The outstanding purchase for the week was that of a local melter who bought 2500 tons of malleable at \$20 per gross ton, delivered. Borings and No. 1 wrought have weakened because of a large amount of distress tonnage on track. Railroad lists include the Pere Marquette, 1160 tons, and a small list of 350 tons for the Nashville, Chattanooga & St. Louis.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	\$19.00 to \$19.50
Cast iron car wheels	18.00 to 18.50
Relaying rails, 56 lb. to 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	20.00 to 20.50
Railroad tires, charging box size	20.50 to 21.00
Railroad leaf springs, cut apart	20.50 to 21.00
Rails for rolling	19.50 to 20.00
Steel rails, less than 3 ft.	21.50 to 22.00
Heavy melting steel	16.75 to 17.00
Frogs, switches and guards, cut apart	18.25 to 18.75
Shoveling steel	16.50 to 16.75
Drop forge flashings	12.50 to 13.00
Hydraulic compressed sheets	14.50 to 15.00
Axle turnings	14.50 to 15.00
Steel angle bars	20.50 to 21.00
Steel knuckles and couplers	20.00 to 20.50
Coil springs	20.50 to 21.00
Low phos. punchings	19.00 to 19.50
Machine shop turnings	10.50 to 11.00
Cast borings	13.25 to 13.75
Short shoveling turnings	13.25 to 13.75
Railroad malleable	19.50 to 20.00
Agricultural malleable	18.50 to 19.00

Per Net Ton

Iron angle and splice bars	18.50 to 19.00
Iron arch bars and transoms	21.50 to 22.00
Iron car axles	27.50 to 28.00
Steel car axles	18.00 to 18.50
No. 1 busheling	13.50 to 14.00
No. 2 busheling	9.50 to 10.00
Pipes and flues	12.00 to 12.50
No. 1 railroad wrought	16.25 to 16.75
No. 2 railroad wrought	15.00 to 15.25
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	17.50 to 18.00
No. 1 agricultural cast	17.00 to 17.50
Locomotive tires, smooth	16.50 to 17.00
Stove plate	15.50 to 16.00
Grate bars	15.50 to 16.00
Brake shoes	15.50 to 16.00

Whaley Constant Pressure Oil Engine

The Sun Shipbuilding & Dry Dock Co., Chester, Pa., has completed the building of the new Whaley oil engine, which was invented by William B. Smith Whaley and designed by Charles A. Muller of the Whaley Engine Patents, Inc. The engine is described as a single-acting four-cylinder two-cycle machine designed to develop 750 hp. It is a vertical reversing engine. The cylinder clearance, at the time of the fuel injection, is opened by a piston valve to communication with a static receiver having many times the capacity of the cylinder clearance. This presents a condition exactly the opposite to that in present internal-combustion engines, where the basis of operation is on a trapped charge. In the Whaley engine, the piston valve to the static receiver is open as long as the fuel is being injected.

The main purpose of the clearance reservoir is to maintain the maximum working pressure desired, which, in the case of the present engine, is 350 lb. per sq. in. As this is the normal compression-pressure of each working cylinder, it is also the normal pressure for the receiver or reservoir. Under normal running conditions, no variation in pressure is expected no matter what the conditions of loading and fuel injection may be. The receiver serves as an absorber in case of any rise in pressure in the cylinder through any cause. By an ingenious arrangement of the valves, the compression-space port is made to serve successively for the introduction of the super-scavenging and super-charging and to establish communication with the reservoir or receiver during the combustion period.

Instead of operating with a trapped charge of air which is confined in closed compression space into which the fuel is injected, with resultant rise in pressure after

combustion takes place, in the case of the Whaley engine it is stated that even early timing of the fuel admission will cause no appreciable pressure-rise above the capacity of the pressure valves into the receiver. According to Parish & Tewksbury, engineers, New York, the engine will weigh less than 100 lb. per horsepower.

Present Status

The Whaley engine at the Sun Shipbuilding & Dry Dock Co.'s plant is now undergoing its shop tests and it is expected that the trials will be completed in time to present all technical details of the engine and the results of performance before the winter meetings of the national engineering societies.

Those who have inspected the engine have stated that it closely resembles a vertical steam engine of sturdy design and having four high-pressure cylinders. They have remarked the absence of cams, rollers and gearing associated with internal-combustion engines and have complimented the inventor and designer on the production of a new internal-combustion engine as simple in construction as a well-built steam engine and one that can apparently be operated by anyone versed in steam engine practice.

The Whaley Engine Patents, Inc., owns the patents for the Western Hemisphere. The International Whaley Engine Corporation owns the patent rights for the Eastern Hemisphere. The American Locomotive Co. owns the exclusive license for the use of the Whaley engine on rails for the Western Hemisphere. The Sun Shipbuilding & Dry Dock Co., Chester, Pa., has a contract for building these engines for marine and stationary use in the United States. The engineering firm of Parish & Tewksbury, Inc., New York, has had executive charge of this development since February, 1924.

New York

Steel Prices Firmer for Fourth Quarter— Argentina Wants 8000 Tons of Pipe

NEW YORK, Sept. 8.—In a week shortened by two holidays sales of pig iron have amounted to less than in the preceding week—probably 5000 tons in the metropolitan district. With little activity in the smaller foundry trade, interest has centered in the recent purchases by large radiator and pipe companies. The American Radiator Co.'s contracts, referred to last week, amounted to something over 40,000 tons, it is now definitely reported, for Eastern and Western plants. On some of this iron the reported basis was \$20 in eastern Pennsylvania. The iron taken by pipe foundries probably amounted to 40,000 tons, including purchases in the South on which the reported basis was \$18, Birmingham. Deliveries on this iron extend over the fourth and first quarters. Among inquiries now before local selling companies are 750 tons for the Baltimore and Jersey City foundries of a gas equipment company and 800 tons for an elevator company, deliveries in both cases being for the fourth quarter.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25..	\$23.02 to \$23.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	23.52 to 24.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	24.02 to 24.52
Buffalo, sil. 1.75 to 2.25.....	23.41 to 23.91
No. 2 Virginia, sil. 1.75 to 2.25..	28.44 to 28.94

Ferroalloys.—Sales of ferromanganese have aggregated from about 750 to 1000 tons the last week, mostly foreign alloy at the full price of \$115, seaboard basis. There were no large orders in this total and all of it was for delivery this year. No substantial inquiry is reported before the market which is described as quiet. Sales of several hundred tons of spiegeleisen are noted at unchanged prices.

Finished Iron and Steel.—A stiffening tendency in prices of some steel products appears as the time comes for fourth quarter contracts. Some mills have withdrawn authority from district sales offices to quote 1.90c., Pittsburgh, on steel bars and the quotation is now said to be 2c. for any delivery. However, some of the larger buyers covered their September requirements at 1.90c. An effort is also being made to obtain 2c., Pittsburgh, on shapes for fourth quarter shipment. Pittsburgh mills are inclined to quote 1.90c. on plates for the last quarter, but Eastern competition at \$2 to \$3 a ton lower makes it seem unlikely that this advance will be effective. In the case of bars and shapes the situation is more within the control of the larger producers and the restoration of the 2c. quotation seems in a fair way to succeed. A better mill situation has given strength to sheet prices, a few companies being booked on some mills for six to eight weeks. Galvanized sheets are generally quoted by independents at 4.30c., Pittsburgh, but the leading interest still takes care of regular trade at 4.20c. On black sheets the range is 3.15c. to 3.20c., Pittsburgh, with an occasional quotation of 3.10c. On blue annealed 2.30c. is now more frequent than 2.25c., but the latter price is still given in some instances. Fourth quarter contracts for cold finished steel bars and shafting are being taken at 2.50c., Pittsburgh. Wire products are firm at 2.50c. for plain wire and 2.65c. for bright nails. September sales have shown a continuance of the August rate of improvement, notwithstanding the lull caused in some lines, particularly structural steel, by the Labor Day holidays, which virtually extended from Thursday to Tuesday in many New York offices. There are no signs yet of large-scale buying of cars by the railroads. An inquiry for upward of 8000 tons of oil well casing for the Argentine Government oil fields is being considered by American pipe mills. Delivery is to be begun in November and carried through each

month until September, 1926. Bids close Sept. 18. The sizes range from 4 in. to 16 in., with one or two sizes that are not standard with American mills. In structural steel the largest inquiry is for 8000 tons for the Savoy Hotel, Fifth Avenue and Fifty-ninth Street, New York, a revived project.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.24c. to 2.34c.; plates, 2.09c. to 2.19c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.14c. to 2.24c.

Warehouse Business.—Improvement is noted in the general run of products, prices showing a firming tendency, except in sheets. The leading independent found last week better than the last two weeks of August. The upper range in sheet prices has been dropped 0.10c. from 5.35c., making galvanized No. 28 gage at 4.90c. to 5.25c., base. Structural steel was most active. To meet competition, especially from Philadelphia jobbers, the quotation of 7c. to 7.25c. on Swedish charcoal iron bars is subject to considerable cutting. For prices see page 732. We quote boiler tubes per 100 ft. as follows:

Lap welded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Cast Iron Pipe.—Although the present is normally the dull season for water pipe, demand from private sources is well maintained and makers are booked for the next 60 days or more. The only sizable municipal inquiry in this district is that of the City of New York for a large tonnage of 6-in. to 24-in. bell and spigot pipe, bids opening Sept. 16. Foreign bids are to be accepted. Jobbers of soil pipe report a moderate volume of business and keen competition.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$50.60 to \$51.60; 4-in. and 5-in., \$55.60 and \$56.60; 3-in., \$65.60 to \$66.60, with \$5 additional for Class A and gas pipe. Discounts of both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 45 to 50 per cent off list; heavy, 55 to 60 per cent off list.

Old Material.—There is apparently no scarcity of scrap, but brokers report a strong inclination on the part of dealers with yards to hold as long as possible for further advances. No. 1 heavy melting steel is quoted at \$16.50 to \$17 per ton, delivered eastern Pennsylvania consumers, as the buying price of brokers. Borings and turnings are being purchased at \$12 per ton delivered, when the freight rate is low and \$13.25 per ton delivered to consumers taking a higher rate. Specification pipe shows a slight advance, brokers now offering \$17 per ton, delivered to an eastern Pennsylvania consumer. Railroad and yard wrought are stronger.

Buying prices per gross ton New York follow:

Heavy melting steel, yard.....	\$12.25 to \$12.75
Heavy melting steel (railroad or equivalent)	13.25 to 13.75
Rails for rolling	14.25 to 14.75
Relaying rails, nominal	23.00 to 24.00
Steel car axles	21.50 to 22.00
Iron car axles	24.00 to 24.50
No. 1 railroad wrought.....	14.50 to 15.50
Forge fire	10.50 to 11.00
No. 1 yard wrought, long.....	13.50 to 14.00
Cast borings (steel mill)	9.50 to 10.00
Cast borings (chemical)	13.00 to 14.00
Machine shop turnings	9.25 to 10.00
Mixed borings and turnings	9.00 to 9.50
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	12.50 to 13.00
Stove plate	11.00 to 12.00
Locomotive grate bars	11.00 to 11.50
Malleable cast (railroad)	15.00 to 15.50
Cast iron car wheels	13.50 to 14.00
No. 1 heavy breakable cast	13.75 to 14.25

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	\$17.50 to \$18.00
No. 1 heavy cast (columns, building material, etc.), cupola size	16.00 to 16.50
No. 2 cast (radiators, cast boilers, etc.)	15.00 to 15.50

The New Castle, Pa., plant of the Stove & Range Co. of Pittsburgh resumed operations on Sept. 8, after having been closed down since last April.

San Francisco

Pre-Holiday Market Brings Out Price Weakness in Plates, Nails and Bars

SAN FRANCISCO, Sept. 5 (By Air Mail).—Featuring the developments of the past week were further indications that prices have failed to strengthen in respect to plates, sheets, bars and nails. In plates 2.25c., c.i.f. Coast ports, is understood to be possible for desirable tonnages. In blue annealed sheets 2.20c., base Pittsburgh, has been named, and about 4.15c., Pittsburgh, is considered as a probable figure for desirable business in galvanized sheets. In reinforcing bars, an Eastern mill is understood to have quoted 2.30c., c.i.f., during the past week in connection with a moderate tonnage for stock. An order for 5000 kegs of wire nails was taken by an Eastern mill a week ago in Los Angeles, at \$3.05 laid down in San Pedro, which is equivalent to \$3.15, f.o.b. Los Angeles. It should be noted, however, that this price is more of an indication of present competitive conditions, than it is of new price weakness in nails.

First bids were opened last night for the Mokelumne River project in Oakland. From all indications it probably will be some time before the low bids can be determined, because of their complicated nature. There seems to be a growing belief that concrete pipe may be used in preference to steel. If such should be the case, between 7000 and 8000 tons of reinforcing bars will be required.

About 600 tons of Belgian steel arrived during the week. This shipment was composed of rails, angles, reinforcing bars, merchant bars and nails. Some of this material is understood to be the balance of a delayed shipment ordered several months ago, and a small amount is said to have been delivered as sample stock.

Only two out of about 30 bids, received by the board of directors of the East Bay Municipal Utility District, covered the entire construction of the municipal water system. All other bids were on portions of the project, or on supplying materials and equipment. The lowest bid was \$12,500,000, submitted by C. W. Twohy of San Francisco and Los Angeles, for a system requiring the pumping of the water. The second blanket bid was submitted by Stephen E. Kieffer, an engineer of Berkeley, representing a combination of construction firms. He bid \$18,565,716 for a pumping system, and \$19,561,754 for a gravity system. All bids will be considered by a board of engineers, and action will be taken as quickly as possible, to award contracts for the work. This board will include, Arthur P. Davis, chief engineer of the district, Gen. George W. Goethals, New York, William Mulholland, Los Angeles and E. E. Grunsky, Oakland.

Pig Iron.—A local user is inquiring for about 1000 tons of malleable iron. The inquiry for 500 tons of foundry iron reported three weeks ago has been placed with a local broker. About 200 to 300 tons of special analysis English foundry iron was entered at this port during the week, en route to a user in the Pacific Northwest. The principal seller of Utah iron is not indicating prices as yet for first quarter business, but it is intimated that he will do so before the end of this month.

•Utah basic	\$27.00 to \$28.00
•Utah foundry, sil. 1.75 to 2.25	27.00 to 28.00
••English foundry	26.00
••Belgian foundry	25.00
••Dutch foundry	24.25 to 25.00
••Indian foundry	25.00
••German foundry	25.00 to 26.00

•Delivered San Francisco.

••Duty paid, f.o.b. cars San Francisco.

Shapes.—Nothing below 2.35c. c.i.f. Coast ports is known to have been named in structural material, and that only for desirable tonnages. Business is being placed at 2.35c. to 2.40c. The general contract for a bridge over Pyallup River on State Road No. 1 near Tacoma, Wash., has been awarded to Grant-Smith Co., and it is understood that Virginia Bridge & Iron Co. is low bidder for the 1783 tons of steel. New bids will be called Sept. 15 for 250 tons required for the State

Exposition Building, Reno, Nev. Bids will be called Sept. 15 for a bridge across the Pyallup River on State Road No. 5, near Tacoma, Wash., for which 167 tons will be needed.

Plates.—Quotations now range from 2.25c. to 2.30c. c.i.f. Coast ports, although some mills continue to quote 2.35c. An inquiry for gas holders for Oakland, Cal., involving about 4000 tons, is understood to have been put out as a "feeler" by the Pacific Gas & Electric Co. This firm contemplates the construction of a 10,000,000-cu. ft. gas holder in Oakland after the first of the year. The contract will probably be placed in the East, as relatively few of the Pacific Coast fabricators are equipped to handle such a job. The largest award of the week was 500 tons placed by the Olympic-Calpet Refining Co., Smith Cove, Seattle, Wash., with the Puget Sound Machinery Depot.

Bars.—Local jobbers of reinforcing bars continue to quote 3.25c., base, 250 tons from stock; 3.35c., base, carload; and 3.80c., base, l.c.l., but recent bids indicate a willingness on the part of some interests to go as low as 3.10c. and in a few instances, lower, when the tonnage is considered desirable. Local mills quote 2.45c., 100-ton lots, f.o.b. San Francisco, for soft steel bars, but 2.40c. is understood to have been named recently. Base quotations per 100 lb. remain at 2.50c., f.o.b. San Francisco. Included among the larger lettings in reinforcing bars during the week were the following:

Atlantic, Gulf & Pacific Co., San Francisco, Cal., small rounds, for shipment to Manila, P. I., 218 tons, to unnamed interest.

Apartment, Bellevue Avenue, between Pike and Pine Streets, Seattle, Wash., 100 tons, to Pacific Coast Steel Co.

Gallileo high school addition, San Francisco, Cal., 100 tons, to W. S. Wettenhall Co.

Pacific Spring Bed Co., factory building, Oakland, Cal., 100 tons, to Truscon Steel Co.

Rails and Track Supplies.—The Key System Transit Co., Oakland, Cal., is inquiring for about 200 kegs of track spikes. Bids close Sept. 10. The Engineering Products Co. has taken 200 tons of 50- and 60-lb. re-layers for the U. S. Engineers at Eureka, Cal.

Warehouse Business.—Pre-holiday dullness characterized business during the past week. The approaching double holiday—Labor Day and Admission Day—coupled with the celebration of California's seventy-fifth anniversary of statehood, probably will delay the development of the stronger buying tendency that is looked for this month. Prices are unchanged.

Merchant bars, \$3.30 base, per 100 lb.; merchant bars, $\frac{1}{2}$ in. and under, rounds, squares and flats, \$3.80 base, per 100 lb.; soft steel bands, \$4.15 base, per 100 lb.; angles, $\frac{3}{4}$ in. and larger x $1\frac{1}{2}$ in. to $2\frac{1}{2}$ in., inc., \$3.30 base, per 100 lb.; channels and tees, $\frac{3}{4}$ in. to $2\frac{1}{2}$ in., inc., \$3.90 base, per 100 lb.; angles, beams and channels, 3 in. and larger, \$3.30 base, per 100 lb.; tees, 3 in. and larger, \$3.30 base, per 100 lb.; universal mill plates, $\frac{1}{4}$ in. and heavier, stock lengths, \$3.30 base, per 100 lb.; spring steel, $\frac{1}{4}$ in. and thicker, \$6.30 base, per 100 lb.; wire nails, \$3.50 base, per 100 lb.; cement coated nails, \$3 base, per 100 lb.; No. 10 blue annealed sheets, \$3.70 per 100 lb.; No. 28 galvanized sheets, \$5.75 per 100 lb.; No. 28 black sheets, \$4.65 per 100 lb.

Cast Iron Pipe.—Recent bids have brought out some low prices, so that \$50 to \$51, base, water shipment, San Francisco, is now more representative of the market than the quotation of \$52 to \$53 of a week ago. The 501 tons required by Beverly Hills, Cal., was awarded to Belgian interests through the Grinnell Co. of the Pacific. Glendale, Cal., awarded 2957 tons to the United States Cast Iron Pipe & Foundry Co., and the same company was awarded 3885 tons by Portland, Ore. Santa Monica, Cal., is expected to call bids soon for 3141 tons, and Cloverdale, Cal., has voted bonds and may call for about 100 tons.

Cold-Rolled Shafting.—The Caterpillar Tractor Co., San Leandro, Cal., has placed 150 tons with an Eastern mill.

Coke.—A local importer received about 1500 tons from England during the week. Buyers are confining their orders to immediate requirements, although some slight improvement in interest has been reported since prices showed weaker tendencies.

English beehive, \$15 to \$16 at incoming dock, and English by-product, \$12 to \$14; German by-product, \$11.50 to \$12.

Boston

Foreign Pig Iron More Active While Domestic Is Less So

BOSTON, Sept. 8.—Foreign pig iron appears more active in this territory, while domestic is less so than it was a week ago. Actual bookings of all irons, however, show a further shrinkage. Of the foreign iron available, Dutch has been the most active of late with sales on a basis of \$21.50 to \$22 on dock Boston, duty paid, mostly \$21.50. Approximately 1000 tons of Indian iron sold the past week in small lots at \$22 on dock, duty paid, and in some instances where the freight rate to point of consumption is small, slightly higher prices were obtained. At least one lot from India sold at \$21.50 on dock, in this instance No. 1X; consequently there apparently is more or less flexibility to foreign iron prices. English, 1.75 to 2.25 per cent silicon, is offered at \$20, on dock, Boston, duty paid, 2.25 to 2.75 silicon at \$20.50, and 2.75 to 3.25 silicon at \$21, but it runs high in manganese and by most New England foundries is considered off iron. Most of the small amount of Buffalo iron sold recently was on a basis of \$19 furnace for both No. 2 plain and No. 2X, but \$18.50 offerings have cropped up again for the same grades. Alabama iron figured moderately in the past week's sales, but comparatively little is doing in eastern Pennsylvania and Virginia brands.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$23.90 to \$24.65
East. Penn., sil. 2.25 to 2.75.....	24.40 to 25.15
Buffalo, sil. 1.75 to 2.25.....	23.41 to 23.91
Buffalo, sil. 2.25 to 2.75.....	23.41 to 24.41
Virginia, sil. 1.75 to 2.25.....	28.42 to 29.42
Virginia, sil. 2.25 to 2.75.....	28.92 to 29.92
Alabama, sil. 1.75 to 2.25.....	28.10 to 28.60
Alabama, sil. 2.25 to 2.75.....	28.60 to 29.10

Plates and Shapes.—The number of fabricating jobs calling for comparatively small tonnages are increasing and gives a more active appearance than noted in months. Several moderately large tonnages, hanging fire for some time, are expected to close shortly. The New England Structural Co. will fabricate the steel for the new Statler Hotel, Boston. The market for shapes appears steady at \$2.265 to \$2.365 per 100 lb. delivered common Boston rate points. Demand for plates is lukewarm and prices still more or less unsettled at \$2.115 to \$2.165 per 100 lb. delivered Boston. Arthur D. Little, Inc., Charles River Road, Boston, is in the market for miscellaneous tanks for a Rhode Island plant, requiring about 200 tons of plates.

Coke.—New England foundry specifications against last half by-product foundry coke contracts have been larger the past week, presumably because of the official calling of the coal strike, and because of the desire of some consumers to lay in a stock before winter. Such buying coupled with heavy demands for domestic fuel, the latter being the heaviest on record for this time of the year, gives the coke market an unusually active appearance. Fuel producers to date are doing well in the matter of shipments, although one oven is still behind on deliveries of foundry fuel. Both the New England Coal & Coke Co. and the Providence Gas Co. quote by-product foundry coke at \$12 a ton delivered where the freight rate does not exceed \$3.10.

Old Material.—Whatever softness in heavy melting steel existed a week ago has been dissipated. Current transactions for New England consumption are conducted on a basis of \$12.50 on cars shipping point, and for Pittsburgh district consumption at \$13. The market on pipe is 50c. a ton higher, recent sales running as high as \$12.60 on cars. A central Massachusetts plant is buying long bundles of skeleton at around \$10.50 on cars, but it is doubtful if that much can be obtained for Pennsylvania shipment. A Portland, Me., firm is still interested in shafting at \$23 delivered, or \$19 to \$19.50 on cars Boston rate points. A Connecticut consumer is offering \$19 to \$20 delivered for railroad malleable and securing some tonnage, while a Norwood, Mass., foundry is taking stove plate at \$14 delivered.

A little textile cast at \$20.50 to \$21 delivered in New England, and machine shop turnings and mixed borings and turnings at \$9 to \$9.50 on cars have moved recently, but comparatively little life is noted in the market for other kinds of scrap.

The following prices are for gross ton lots delivered consuming points:

Textile cast	\$20.00 to \$21.00
No. 1 machinery cast	19.00 to 19.50
No. 2 machinery cast	15.50 to 16.50
Stove plates	13.50 to 14.00
Railroad malleable	19.00 to 20.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$12.50 to \$13.00
No. 1 railroad wrought	13.00 to 13.50
No. 1 yard wrought	12.00 to 12.50
Wrought pipe (1 in. in diam., over 2 ft. long)	12.00 to 12.60
Machine shop turnings	9.00 to 9.50
Cast iron borings, chemical....	11.00 to 11.50
Cast iron borings, rolling mill..	9.00 to 9.50
Blast furnace borings and turnings	8.50 to 9.00
Forged scrap	9.50 to 10.50
Bundled skeleton, long	10.00 to 10.50
Forged flashings	10.00 to 10.50
Bundled cotton ties, long	9.00 to 9.25
Bundled cotton ties, short	10.00 to 10.50
Shaftings	19.00 to 19.50
Street car axles	18.00 to 18.50
Rails for rerolling	12.50 to 13.50
Scrap rails	12.50 to 13.00

Birmingham

Southern Pig Iron Market Stronger—Florida Hotels Take Steel Tonnage

BIRMINGHAM, Sept. 8.—Several large sales recently and continued steady buying on the part of the smaller industries bring the pig iron market to a stronger position. The probable output of fourth quarter will be fairly well sold before the end of this month. Quotations are still \$18.50 and \$19 for No. 2 foundry. The cast iron pipe trade loses none of its activity, and other interests are confident of steady operation during the winter. The low stage of the Tennessee River caused by drought brought about the movement of a considerable tonnage of iron by rail. It had been moving from the northwestern part of the State into the Middle West by barge. Some of the blast furnaces were threatened for a few days with a water shortage, but no interruption of production resulted. Several of the iron melters in this territory are enjoying a good trade with Florida, and this trade will continue through the winter, the only difficulty being the freight embargo which has been in effect in that State for the past few weeks. Production of pig iron continues at the same rate, 11 blast furnaces being on foundry and 13 on basic iron.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil.....	\$18.50
No. 1 foundry, 2.25 to 2.75 sil.....	19.00
Basic	18.50
Charcoal, warm blast	30.00

Cast Iron Pipe.—New contracts received by Southern cast iron pressure pipe manufacturers are steadily adding to the unfilled tonnage on books and reiteration is given to the statement that there will be steady operation of plants through the winter. Movement of pipe is equal to the production. Alabama cast iron pipe is being shipped in all directions, many movements being under rush instructions to meet the close of season. Quotations are based on 6-in. and over pipe at \$40 to \$41.

Finished Steel.—Steel for the largest structure to be erected in Florida, the Congress office building at Miami, requiring 2200 tons, will be produced and fabricated in Birmingham, the Tennessee Coal, Iron & Railroad Co. to make the steel and the Ingalls Iron Works to fabricate it. In addition to the steel for the Congress office building, the Ingalls Iron Works will supply tanks, stairways and Massillon joists. Another structure at West Palm Beach will be erected. Completing a large amount of work on the West Coast of Florida, the Ingalls company is moving its forces to the East Coast, where contracts will keep them busy for months to come. Both plants of the Ingalls Iron

Works, the fabricating plant and the tank works, the latter at North Birmingham, are now well supplied with contracts. August business was the greatest in the history of this company, and similar business is expected for the next several months, the Florida demands to continue indefinitely. Steel mills of the district continue to operate fairly well. Soft steel bars are quoted at 2.05c. to 2.15c.

Coke.—Better feeling obtains in the Southern coke market, shipment into the Southwest and Northwest continuing, while consumption in home territory holds up well. Coke producers express a belief that the strike in the hard coal districts may bring about a need for the sized and prepared coke of the Birmingham district.

Scrap.—While no change is noted in scrap quotations, a better feeling is observed. Much old material is moving to yards and to consumers. Heavy melting steel consumption has been boosted in this territory by the new open-hearth furnaces of the Tennessee Coal, Iron & Railroad Co. using quite a tonnage.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical.....	\$15.00 to \$16.00
Heavy melting steel.....	13.00 to 14.00
Railroad wrought.....	12.00 to 13.00
Steel axles.....	16.00 to 17.00
Iron axles.....	16.00 to 17.00
Steel rails.....	13.00 to 14.00
No. 1 cast.....	16.00 to 16.50
Tramcar wheels.....	16.50 to 17.00
Car wheels.....	15.00 to 16.00
Stove plate.....	13.00 to 13.50
Machine shop turnings.....	7.00 to 8.00
Cast iron borings.....	7.00 to 8.00
Rails for rolling.....	16.50 to 17.00

Buffalo

Fair Pig Iron Inquiry—Steel Business Relatively Quiet

BUFFALO, Sept. 8.—Inquiry for the week runs a trifle less than 5000 tons, with the largest individual lot a New England requirement for 1000 tons of foundry. Most of the inquiry is for fourth quarter, as is also most of the sales, furnaces being loath to quote on first quarter delivery in view of the uncertainty as to prices of coke. One furnace announces a schedule of \$19, \$19.50 and \$20, for the three silicon grades of foundry iron for fourth quarter and first quarter delivery, but the going price for the fourth quarter is about \$18.50. Lackawanna plant of Bethlehem Steel Co. has lighted an additional stack, making 11 blowing in the district. The American Radiator Co. has purchased 15,000 tons for plants outside this district.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25.....	\$18.50 to \$19.00
No. 2X foundry, sil. 2.25 to 2.75.....	18.50 to 19.00
No. 1 foundry, sil. 2.75 to 3.25.....	19.00 to 19.50
Malleable, sil. up to 2.25.....	18.50
Basic.....	18.50
Lake Superior charcoal.....	29.28

Finished Iron and Steel.—A better movement is noticeable in shapes with 2.265c. the going price. No large lots have been placed, but the smaller lots are more numerous. Bars show little improvement. A lot of 400 tons for concrete reinforcement for the new Fairmont Creamery is about to be placed. Makers here assert they have not encountered anything below the Buffalo equivalent of 2c., Pittsburgh, in reinforcing bars, for mill shipments. The sheet market is good, with makers trying to get the local equivalent of 3.20c., Pittsburgh, on black and 4.20c. to 4.30c. on galvanized. Warehouse business held up during August and conditions of mill schedules have compelled small buyers to go to warehouses for their requirements.

Warehouse prices are being quoted as follows: Steel bars, 3.25c.; steel shapes, 3.35c.; steel plates, 3.35c.; No. 10 blue annealed sheets, 3.80c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.45c.; cold rolled shapes, 4.40c.; cold rolled rounds, 3.95c.; wire nails, 4c.; black wire, 4.05c.

Old Material.—Prices have stiffened to some extent in this district, though they seem to be a bit weaker outside. One order for heavy melting steel was placed at \$19, but it was rather a small one. Dealers are offering \$17.50 for tonnage on old orders but the going

price appears to be \$18 to \$18.50. To obtain material to suit the requirements of one special mill expected in the market within the next month or five weeks, some dealers are offering \$18.25 to \$18.50 for high-grade No. 1 heavy melting steel. Considerable steel in railroad lists came to Buffalo and brought over \$18. The hydraulic compressed sold about \$1 under heavy melting steel. Some malleable sold as high as \$19.50 and some low phosphorus at \$20. Steel axles are bringing \$24 to \$25 in the East, equivalent to \$20 Buffalo.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel.....	\$18.00 to \$18.50
Low phosphorus.....	20.00 to 20.50
No. 1 railroad wrought.....	16.50 to 17.00
Car wheels.....	16.50 to 17.50
Machine shop turnings.....	12.50 to 13.00
Cast iron borings.....	13.00 to 13.50
No. 1 busheling.....	16.50 to 17.00
Stove plate.....	15.50
Grate bars.....	14.50 to 15.00
Hand bundled sheets.....	14.00 to 14.50
Hydraulic compressed.....	17.00 to 17.50
No. 1 machinery cast.....	16.50 to 17.00
Railroad malleable.....	19.00 to 19.50
No. 1 cast scrap.....	17.00 to 17.50
Iron axles.....	26.00 to 27.00
Steel axles.....	20.00 to 20.50

St. Louis

Deadlock on Scrap—Pig Iron Demand Subsides with Furnaces Well Booked

ST. LOUIS, Sept. 8.—Melters having purchased enough pig iron previous to the last two weeks to cover their requirements through the third quarter, the market is extremely quiet and sales and inquiries are light. There is a firm tone to the market and furnaces are not pushing sales because of their comfortable backlogs and prospects of a buying movement with the opening of the fourth quarter. Shipments of the Granite City stack exceed the make, and its sales during the week totaled about 1000 tons of foundry iron for prompt shipment in lots ranging from a carload up to 100 tons. No inquiry of size is pending. With the exception of shops catering to the railroad trade, melt is increasing, satisfactory reports coming from the agricultural implement and stove interests. Prices are unchanged.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices, \$2.16 freight from Chicago, \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City.

Northern fdy., sil. 1.75 to 2.25.....	\$22.66 to \$23.16
Northern malleable, sil. 1.75 to 2.25.....	22.66 to 23.16
Basic.....	22.66 to 23.16
Alabama fdy., sil. 1.75 to 2.25 (rail).....	22.67 to 24.17
Tennessee fdy., sil. 1.75 to 2.25.....	22.67
Granite City iron, sil. 1.75 to 2.25.....	22.31 to 22.81

Finished Iron and Steel.—Railroad inquiries are few in number and for very small quantities of material, and manufacturers of steel products continue to buy only in the smallest possible volume. Fabricators in the district are busy, but are not buying steel. La Clede Steel Co has taken contracts for 170 tons of reinforcing bars for a bridge over River Des Peres at Broadway, St. Louis, and 175 tons for a garage at Louisville, Ky.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.25c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, cold rolled, one pass, 4.50c.; galvanized sheets, No. 28, 5.50c.; black corrugated sheets, 4.65c.; galvanized, 5.65c.; cold-rolled rounds, shafting and screw stock, 3.70c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, $\frac{1}{4}$ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, \$3.50; hexagons, blank or tapped, \$4 off list.

Coke.—With the strike on in the anthracite fields, greater interest is shown in fuel, but as yet no material expansion in coke buying has developed. Both foundry and domestic grades are in increasing demand, but this is due to natural causes. Demand for Connellsville grades is light, and the by-product ovens are getting nearly all of the current business. Shipments are in excess of production.

Old Material.—Consumers and dealers in the St. Louis industrial district are deadlocked on the question

of price. Consumers declare that quotations are too high and are not justified by prices of the finished material, while dealers will not sell at prices offered by users. Although there is little buying except for absolute necessity or of "distress" cars, dealers continue to pay higher prices for material. Railroad lists continue to bring good prices, current offerings including the Chicago & Eastern Illinois, 750 tons; the St. Louis-San Francisco, 800 tons, and the Wabash, 225 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$15.00 to \$15.50
Rails for rolling	19.50 to 20.00
Steel rails less than 3 ft.	19.00 to 19.50
Relaying rails, 60 lb. and under	24.00 to 25.00
Relaying rails, 70 lb. and over	31.00 to 33.00
Cast iron car wheels	18.50 to 19.00
Heavy melting steel	15.50 to 16.00
Heavy shoveling steel	15.50 to 16.00
Frogs, switches and guards cut apart	19.00 to 19.50
Railroad springs	19.50 to 20.00
Heavy axles and tire turnings	13.00 to 13.50
No. 1 locomotive tires	17.50 to 18.00
Per Net Ton	
Steel angle bars	16.50 to 17.00
Steel car axles	19.00 to 19.50
Iron car axles	26.00 to 26.50
Wrought iron bars and transoms	20.00 to 20.50
No. 1 railroad wrought	13.75 to 14.25
No. 2 railroad wrought	13.75 to 14.25
Cast iron borings	11.75 to 12.25
No. 1 busheling	13.00 to 13.50
No. 1 railroad cast	16.50 to 17.00
No. 1 machinery cast	17.50 to 18.00
Railroad malleable	15.50 to 16.00
Machine shop turnings	8.00 to 8.50
Champion bundled sheets	9.25 to 9.75

Philadelphia

Steel Company Buys 30,000 Tons of Basic Iron—Business Generally Is Better

PHILADELPHIA, Sept. 8.—The week's developments, albeit a holiday week, point clearly to stronger and more active markets. A purchase of 30,000 tons of basic pig iron by a steel company from another steel company has given strength to the pig iron market, although the price of the iron did not represent an advance over the last large basic sale. Higher coke prices are also an influence on pig iron and sellers believe that now prices will advance.

In steel the situation is quite satisfactory to the mills except for prices and the belief is held that this month will bring sufficient increase in the volume of business to wipe out some of the concessions which are now being granted. Locomotive builders hear that inquiries for 300 to 400 locomotives will soon come into the market and this business is badly needed by the engine builders. Railroad orders this month have shown an improvement. While no large tonnages have been bought, the orders for small lots are much more numerous and haste in shipping is requested in almost every instance.

Bituminous coal is up about 10c. a ton from some mines and a greatly increased demand has come from New England, which is receiving coal by coastwise vessels from Hampton Roads shipping points. The coal situation, it is believed, will soon begin to make itself more strongly felt in the coke market, and in turn pig iron and perhaps steel, too, will be affected.

Pig Iron.—Purchase of 30,000 tons of basic iron by an Eastern steel company has given new strength to the eastern Pennsylvania market, notwithstanding the fact that the price was about \$20.50, delivered, which is the figure at which the same company bought several weeks ago. The latest purchase is for fourth quarter delivery and will take the entire output of one furnace for the latter three months of the year. The coke situation now threatens to force pig iron prices up. A company having a sliding scale coke contract has already been obliged to pay about 50c. a ton more for coke than it was paying last month, while another furnace interest, anticipating that it may be obliged to go into the market and buy spot coke at higher prices,

is withholding from sale some fourth quarter iron. It is now the belief of sellers of iron that prices will go higher, but just how much is a question in view of the foreign pig iron competition. Sales of foundry iron within the past week have mostly been on a \$20.50 base, but \$21 has been tried out in a number of instances and on small lots there has been no difficulty in getting that figure for No. 2 plain. No. 2X is 50c. a ton above No. 2 plain, while on No. 1X a furnace has been able to get \$1 over the price of No. 2X, or \$22 furnace. It develops that the recent purchase of the American Radiator Co. for its plant at Bayonne, N. J., was at less than \$20.50, but it did not surprise the trade that the seller, a steel company, was willing to make a concession for such a large tonnage. The furnace at Port Henry, N. Y., which has been banked for some time, has been blown out. It is reported that the Colorado Iron Co. furnace may go in about Oct. 1.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$21.26 to \$21.63
East. Pa. 2X, 2.25 to 2.75 sil.	21.76 to 22.13
East. Pa. No. 1X	22.26 to 22.63
Virginia No. 2 plain, 1.75 to 2.25 sil.	28.67 to 29.17
Virginia No. 2X, 2.25 to 2.75 sil.	29.17 to 29.67
Basic delivery eastern Pa.	20.50 to 21.50
Gray forge	21.00 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	22.00 to 23.00
Copper bearing low phos. (f.o.b. furnace)	22.50 to 23.50

Ferroalloys.—Moderate-size sales of ferromanganese have been made at \$115, furnace or seaboard, by the domestic producer and importers.

Billets.—Mills quoting \$35, Pittsburgh, on rerolling billets and \$40 on forging billets are losing business and hint at concessions being offered by some of their competitors. An inquiry for 500 tons of forging billets will bring a test of the price.

Plates.—The outlook for plates is somewhat better. Business has increased slightly. The Lukens Steel Co. is now operating nine open-hearth furnaces. Locomotive builders are expecting inquiries for 300 or 400 locomotives within the next few weeks. Orders for plates from the railroads, which have been very small during the summer, are expected to be considerably larger this month. All of the smaller orders are at 1.80c. or 1.85c., Pittsburgh, but larger buyers have no difficulty in finding quotations of 1.75c.

Warehouse Business.—Prices are unchanged, for local delivery being as follows:

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 2.80c. to 3c.; tank steel plates, ½ in., 3c.; blue annealed steel sheets, No. 10 gage, 3.35c.; black sheets, No. 28 gage, 4.35c.; galvanized sheets, No. 28 gage, 5.45c.; square, twisted and deformed steel bars, 3c.; structural shapes, 2.75c. to 2.90c.; diamond pattern plates, ¼ in., 5.30c.; ½ in., 5.50c.; spring steel, 5c.; rounds and hexagons, cold-rolled steel, 4c.; squares and flats, cold-rolled steel, 4.50c.; steel hoops, 4.25c. base; steel bands, No. 12 gage to ¾ in., inclusive, 3.90c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50c.

Structural Material.—A good deal of work in Philadelphia and vicinity which has been pending for some weeks is expected to be closed this week or next. Very few contracts have been placed in the past week. Plain material prices have not strengthened, though fabricated steel prices have. Shapes are to be had from the larger mills at 1.90c., Pittsburgh, but one or two of the smaller mills are making occasional sales at the equivalent of 1.80c., Pittsburgh. A few sales have been made at a Philadelphia delivered price which figures back to 1.77½c., Pittsburgh.

Bars.—The 1.90c. price on steel bars is still being reserved for the larger buyers and small-lot buyers are paying 2c., Pittsburgh, almost without exception. Demand is fairly good. Bar iron is quoted at 2.12c. to 2.22c., Philadelphia.

Sheets.—An increasing number of sales of blue annealed sheets is being made at 2.30c., Pittsburgh, but quotations of 2.25c. are to be had on the more attrac-

tive lots. Galvanized sheet quotations range from 4.20c. to 4.30c. and on black the range is from 3.10c. to 3.20c., Pittsburgh.

Old Material.—An Eastern steel company bought a fair-sized lot of heavy melting steel at \$17.50, delivered, and would have placed orders for 10,000 tons or more had it been available at the same price. Notwithstanding an easing in the steel scrap situation at Pittsburgh, the Eastern market appears very strong. The past week has not brought many advances in the miscellaneous grades, but each new purchase boosts the price on whatever kind of scrap is bought. A steel company paid \$14.50 for a tonnage of bundled sheets and machine shop turnings, but having satisfied its requirements for the time being, withdrew from the market.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	\$17.50
Scrap rails	17.50
Steel rails for rolling.....	18.50 to 19.00
No. 1 low phos. heavy 0.04 and under	22.00 to 22.50
Couplers and knuckles.....	21.50 to 22.00
Rolled steel wheels.....	21.50 to 22.00
Cast iron car wheels.....	18.50 to 19.00
No. 1 railroad wrought.....	17.50 to 18.50
No. 1 yard wrought.....	17.00 to 17.50
No. 1 forge fire.....	15.00 to 15.50
Bundled sheets (for steel works)	14.50
Mixed borings and turnings (for blast furnace use).....	13.00 to 13.50
Machine shop turnings (for steel works use).....	14.50
Machine shop turnings (for rolling mill use).....	14.50 to 15.00
Heavy axle turnings (or equivalent).....	15.50 to 16.00
Cast borings (for steel works and rolling mill).....	14.00
Cast borings (for chemical plant).....	16.00 to 16.50
No. 1 cast.....	18.00 to 18.50
Heavy breakable cast (for steel plants).....	17.00 to 17.50
Railroad grate bars.....	15.00
Stove plate (for steel plant use).....	15.00
Wrought iron and soft steel pipes and tubes (new specifications).....	16.50 to 17.00
Shafting	24.00 to 25.00
Steel axles	24.50 to 25.00

Cincinnati

Southern Iron Advances—Bar Quotations Raised—Black Sheets Weak

CINCINNATI, Sept 8.—Accession of strength in pig iron prices is the outstanding feature of a rather sluggish market. Alabama iron has advanced from \$18.50 to \$19, base, Birmingham, for prompt shipment, while an increase of 50c. in Tennessee iron raises it to \$18, Birmingham. Southern Ohio furnace interests are not taking business under \$20, Ironton. Several sizable tonnages of Lake and Valley iron have moved into this territory in the past week. A southern Indiana melter has contracted for 1000 tons of low phosphorus iron. It is reported that a large local consumer has bought heavily for its fourth quarter requirements. Alabama iron is selling in small lots, with the exception of 500 tons for an Indiana consumer and 150 tons of high silicon iron for Michigan delivery. Sales of Northern foundry have been confined to unimportant tonnages. Inquiries are scarce. A Michigan melter is asking for 4000 tons of foundry iron for prompt shipment. A Richmond, Ind., consumer is inquiring for 500 tons of foundry iron, while a Connersville, Ind., melter is in the market for 400 tons of malleable. Activities in silvery iron include a sale of 600 tons in Michigan. Silvery furnaces are adhering more closely to their price schedules. A local dealer has disposed of 200 tons of fluorspar.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base).....	\$22.55 to \$23.05
Alabama fdy., sil. 2.25 to 2.75.....	23.05 to 23.55
Tennessee fdy., sil. 1.75 to 2.25.....	21.55
Southern Ohio silvery, 8 per cent.....	23.27
Southern Ohio fdy., sil. 1.75 to 2.25	21.77 to 22.27
Southern Ohio, malleable.....	21.27 to 21.77

Bars, Plates and Shapes.—While buying has sided somewhat following the activity of late August,

appreciable tonnages are being booked by Eastern mills. Several producers declare that their August orders exceeded those of July by 25 per cent. Sellers are resisting efforts of consumers to continue buying at prices which have prevailed for several weeks. Mills are again quoting 2c., Pittsburgh, on bars and shapes and 1.90c., Pittsburgh, on plates. They will dip below these figures only on attractive lots for immediate shipment. In the belief that prices will strengthen, producers are not seeking fourth quarter business. Evidence of greater mill activity is seen in the inability of sellers to deliver bars in less than four weeks, whereas recently they could be obtained in 10 days. Fabricators report an increase in industrial jobs.

Reinforcing Bars.—Bids have been submitted on 300 tons for a new warehouse for the Atlantic & Pacific Tea Co. at Columbus, Ohio. The Kroger Grocery & Baking Co., Cincinnati, is to erect a warehouse in Columbus which will take approximately 500 tons. No important awards have been made the past week, but the outlook is promising for a pickup in activities. Prices are firming up, but no actual changes have occurred. New billet bars are selling at 2c. to 2.10c., mill, while rail steel bars are bringing 1.90c., mill.

Wire Products.—The local market is taking on more life. Sellers report that orders are more numerous and total a substantial tonnage. The increased demand is well distributed among all wire goods. Purchases by jobbers have been an influential factor in recent sales. Prices of Eastern mills remain at 2.65c., Pittsburgh, on common wire nails and at 2.50c., Pittsburgh, on plain wire. Some independent producers are shading these quotations.

Sheets.—The week has been productive of several large orders and bookings have been fairly satisfactory. Weakness has developed in black sheets which are selling under 3.15c., Pittsburgh, the price which has prevailed for a considerable period. Strenuous efforts of mill representatives to establish galvanized sheets on a basis of 4.30c., Pittsburgh, have been ineffective, and many consumers are filling their needs at quotations below this figure. Blue annealed sheets are quoted at 2.30c., Pittsburgh, while auto sheets are selling at 4.25c., Pittsburgh. Producers are taking orders for October delivery, but are reluctant to book tonnages for later shipment.

Warehouse Business.—Orders for the first week of September indicate that the volume of business this month will run ahead of that of August. A marked improvement in the movement of bars has stimulated the market. Structural steel is in fair demand, but sales of pipe and tubular goods are lagging. Prices are displaying strength but no immediate changes are anticipated.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4c. to 4.25c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds and hexagons, 3.85c.; squares, 4.35c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.10c.; No. 28 galvanized sheets, 5.25c.; No. 9 annealed wire, \$3 per 100 lb.; common wire nails, \$2.95 per keg base; cement coated nails, \$2.40 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes: prices net per 100 ft. lap welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

Coke.—Interest centers about the domestic market, which is displaying extraordinary activity. The usual increased demand in the early fall, coupled with the flurry caused by the anthracite strike, has placed sellers in a strong position. Several by-product coke producers, who are selling but little furnace coke, owing to the inactivity of southern Ohio merchant furnaces, are finding an outlet for large tonnages of domestic coke in Michigan. Shipments of foundry coke parallel those of August.

Old Material.—With mills manifesting no interest the scrap market is dull. There is little activity, aside from trading among dealers and, although prices are slightly weaker, no actual changes have been recorded. Dealers are holding their material in anticipation

of a revival of mill buying soon. The Norfolk & Western Railroad has a small list closing this week.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel.....	\$15.00 to \$15.50
Scrap rails for melting.....	14.50 to 15.00
Short rails.....	18.50 to 19.00
Relaying rails.....	28.00 to 28.50
Rails for rolling.....	15.50 to 16.00
Old car wheels.....	14.00 to 14.50
No. 1 locomotive tires.....	17.00 to 17.50
Railroad malleable.....	16.00 to 16.50
Agricultural malleable.....	15.50 to 16.00
Loose sheet clippings.....	10.50 to 11.00
Champion bundled sheets.....	12.00 to 12.50

Per Net Ton	
Cast iron borings.....	9.00 to 9.50
Machine shop turnings.....	8.00 to 8.50
No. 1 machinery cast.....	19.00 to 19.50
No. 1 railroad cast.....	15.50 to 16.00
Iron axles.....	23.00 to 23.50
No. 1 railroad wrought.....	12.00 to 12.50
Pipes and flues.....	9.00 to 10.00
No. 1 busheling.....	11.00 to 11.50
Mixed busheling.....	9.50 to 10.00
Burnt cast.....	10.00 to 10.50
Stove plate.....	11.00 to 11.50
Brake shoes.....	11.00 to 11.50

Cleveland

Steel Demand Gaining and Bars Stiffer— Good Pig Iron Buying

CLEVELAND, Sept. 8.—The demand for steel seems to be gaining from week to week. Good tonnages are being placed by consuming industries, and some plants are buying for stock. Consumers are also taking more interest in their fourth quarter requirements, and some contracts were placed for that delivery during the week. Orders from the automotive industry are holding up to last month's volume. Car builders are reported keeping up close to recent schedules outside of the Ford Motor Co., which is temporarily operating on a reduced capacity, because of changing over to its new models. About the only change in the price situation is a firmer market on steel bars and a softness in plate prices. Some leading mills are now holding to 2c. for steel bars, and to that extent that has become the ruling price. On plates 1.80c. has become more common, although small lot business is being taken at 1.90c. Structural material is firm at 1.90c., with some of the mills holding to 2c. The Standard Oil Co. of New Jersey has revived an inquiry for stills requiring 3000 tons of plates. The Akron, Canton & Youngstown Railroad has placed 4300 tons of rails and 200 tons of angle bars with a Pittsburgh district mill. Structural awards include 4000 tons for a power house for Detroit, but new structural inquiry is rather light.

Semi-Finished Steel.—Several inquiries for sheet bar contracts for the fourth quarter have not yet resulted in sales. The open market quotation remains at \$35, Youngstown, for sheet bars, billets and slabs, but some consumers are getting sheet bars at \$33.50.

Pig Iron.—Buying continues for the fourth quarter in good volume, with sales by Cleveland interests aggregating 30,000 tons during the week, or about the same as the previous week. The National Malleable & Steel Castings Co. has purchased 20,000 tons of malleable iron for its various plants, including Cleveland, for the last quarter. Sales to foundries in the immediate Cleveland territory were larger during the week than for some time previous. Some business came from the automotive and stove industries in the Michigan territory. Additional inquiries have come out for first-quarter contracts, and one producer has given some quotations for that delivery, somewhat above prevailing prices, but so far has made no first quarter sales. In steel-making iron, a Canton consumer is inquiring for 10,000 tons of basic iron for the first quarter, but most furnaces have so far refused to quote on any grade for that delivery. The market has a very firm tone, and one Lake furnace that has been on a \$20 basis is now on a range of \$20 to \$20.50. The Cleveland price is unchanged at \$19.50 at furnace for local delivery, and \$18.50, Valley, for

outside shipment, although one producer is holding to \$19 for shipment outside.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 from Birmingham:

Basic, Valley furnace.....	\$18.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25.....	20.00
Southern fdy., sil. 1.75 to 2.25.....	\$23.51 to 26.01
Malleable.....	20.00
Ohio silvery, 8 per cent.....	29.02
Standard low phos., Valley furnace.....	27.50 to 28.00

Iron Ore.—Shipments of Lake Superior ore by water during August amounted to 8,532,718 tons, or practically the same as July, when the movement was 8,525,063 tons. The total shipments by water for the season up to Sept. 1 were 35,457,153 tons, showing a gain of 6,660,444 tons, or 23.13 per cent, over the corresponding period last year.

Sheets.—The sheet market shows a firmer tone, particularly on galvanized sheets, which mills are holding to 4.30c. for the fourth quarter, although some will still take immediate specifications at 4.20c. Black sheets range from 3.10c. to 3.15c., and blue annealed from 2.25c. to 2.30c., with the higher quotations becoming somewhat more common.

Strip Steel.—The demand for cold rolled strip steel from the automotive industries is heavy, and cold rolled mills continue to place considerable tonnage in hot rolled strip, which is firm at regular quotations. Cold rolled strip is firm at 3.75c.

Warehouse Business.—The irregularity in jobbers' prices on sheets that has existed for some time has resulted in a downward revision of warehouse prices of \$3 a ton on galvanized sheets and \$2 a ton on black and blue annealed sheets. Warehouse business is satisfactory in most lines.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 3.80c.; No. 28 galvanized sheets, 4.95c.; No. 10 blue annealed sheets, 3c.; cold-rolled rounds and hexagons, 3.80c.; flats and squares, 4.30c.; hoops and bands, 3.85c.; No. 9 annealed wire, \$3 per 100 lb.; No. 9 galvanized wire, \$3.45 per 100 lb.; common wire nails, \$3 base per 100 lb.

Bolts, Nuts and Rivets.—Some of the bolt and nut makers have opened their books for fourth quarter contracts at present prices, which are firm. The demand continues good. Rivets are quiet, and prices are still irregular.

Old Material.—Weakness has developed in the market, and quotations on a number of grades are lower, the sharpest decline being in machine-shop turnings. However, the price decline appears to have been checked and the market now shows a little firmer tone. Buying by mills is light, the lower prices apparently not having stimulated sales. Scrap is plentiful, and yard dealers are now laying in considerable material, particularly machine shop turnings.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$17.00 to \$17.50
Rails for rolling.....	17.00 to 17.50
Rails under 3 ft.....	19.00 to 19.50
Low phosphorus melting.....	18.00 to 18.25
Cast iron borings.....	14.00 to 14.25
Machine shop turnings.....	13.25 to 13.50
Mixed borings and short turnings.....	14.00 to 14.25
Compressed sheet steel.....	15.50 to 15.75
Railroad wrought.....	13.50 to 14.00
Railroad malleable.....	18.50 to 19.00
Light bundled sheet stampings.....	12.00 to 12.25
Steel axle turnings.....	15.25 to 15.50
No. 1 cast.....	18.00 to 18.50
No. 1 busheling.....	11.00 to 14.25
Drop forge flashings.....	13.00 to 13.50
Railroad grate bars.....	13.50 to 13.75
Stove plate.....	13.50 to 13.75
Pipes and flues.....	12.00 to 12.25

The walls and the roof of the Phelps Street plant of the Falcon Bronze Co., Youngstown, weakened by excavations for a new warehouse adjoining its plant, collapsed Aug. 31. Machinery was buried in the debris and the property will be unable to operate for 30 days. In the meantime, orders will be filled at the company's plant on Poland Avenue, recently acquired from the Lumen Bearing Co.

GERMAN DIFFICULTIES

Hand-to-Mouth Buying Begets Part-Time Work —Credit Facilities Lacking

WASHINGTON, Sept. 5.—With a decided falling off in the domestic demand for steel, the German iron and steel industry's crisis is increasing in severity, it is pointed out in trade advices to the Department of Commerce. Part-time work has become general in the Ruhr, and a number of plants are closing down additional furnaces. The domestic demand for semi-finished steel has been decreasing to a marked degree.

While several months ago there was much complaint of delayed deliveries, buying now has become a hand-to-mouth proposition. The falling market has made it difficult for the steel syndicate to realize one of its chief purposes—that of holding up minimum prices for domestic sales. The syndicate also has found it difficult to maintain a flexible export price policy through limited production.

As to the Russian market, formerly an important outlet for the German industry, less optimism is shown than at any time in the last few years. Despite prolonged treaty negotiations, important orders from Russia are hedged about with so many restrictions and conditions that German firms hesitate to accept them. Prospects in southern European countries continue to be conditioned by tariff difficulties, and efforts to build up a domestic industry, notably in Italy. The inability of German firms to grant liberal credits, even in cases where they are amply justified, is an important factor in cutting down business with the Balkan countries.

No Important Developments in Otis-Trumbull Merger

CLEVELAND, Sept. 8.—No important developments have occurred the past week in the proposed merger of the Otis Steel Co., Cleveland, and the Trumbull Steel Co., Warren, Ohio, as the entire matter has been held up awaiting the new audit of the Trumbull books, which is expected to be submitted at a meeting of the directors to be held tomorrow. Jonathan Warner, former president of the Trumbull company, is understood to have pledged personal property to the steel company to make up any errors that the new audit may show. This is being prepared for the bankers who wrote the \$17,500,000 of debentures that were withdrawn from the market.

Cooling Coke by a Dry Process

A radically new process for cooling coke has been developed in Switzerland. It is known as the Sulzer system of dry coke cooling, originated and patented by Sulzer Frères, Winterthur, Switzerland.

The object of the process is to recover the sensible heat contained in the coke as discharged from the retorts and coke ovens, and to utilize it for producing steam of any desired pressure. The design of the new system provides for one or several large air-tight containers into which the hot coke is charged at suitable intervals. A boiler and a centrifugal fan are connected to each of the containers. The cooling of the coke is effected by means of an inert gas, mainly nitrogen, which is circulated through the system by the fan and which transports the heat from the glowing coke to the boiler. The amount of steam thus raised is reported as averaging about 400 lb. at 212 deg. Fahr. for every 1000 lb. of coke cooled.

Besides the recovery of heat, some other advantages claimed are the following:

In the usual process of wet quenching as at present practised in most large by-product plants, the coke is subjected to a sudden contraction by the water, causing it to break up into smaller pieces and increasing the production of breeze and dust. By cooling the coke gradually by means of gases its solidity is retained so that it is more resistant to shock and abrasion. At the

same time a greater proportion of large coke is produced. A high percentage of moisture, always present in water-quenched coke, is avoided by the new process, and the calorific value of the coke correspondingly increased. Other advantages claimed are the saving in the quenching water necessary and the elimination of damage done to plant and conveyors by the acid vapors given off during the wet quenching process.

The process is reported as in successful operation in Europe in a number of plants operating on a large scale.

Pig Iron Purchasing Encouraging Detroit Scrap Market

DETROIT, Sept. 8.—A sizable tonnage of pig iron has been bought by melters in the district, covering fourth quarter requirements at slightly higher figures than those quoted for the third quarter. Purchases have been made to cover orders on books and higher prices on pig iron may result in a greater amount of scrap being consumed locally over the rest of the year. Prices on scrap are unchanged.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	\$14.50 to \$15.00
Borings and short turnings.....	11.75 to 12.25
Long turnings	11.25 to 11.75
No. 1 machinery cast.....	15.00 to 16.00
Automobile cast	21.00 to 22.00
Hydraulic compressed	13.75 to 14.25
Stove plate	12.50 to 13.00
No. 1 busheling.....	12.75 to 13.25
Sheet clippings	9.00 to 10.00
Flashings	12.00 to 12.50

COMING MEETINGS

September

American Society of Mechanical Engineers. New Haven Section. Sept. 8 to 11. Fifth annual machine tool exhibition, Mason Laboratory, Yale University, New Haven, Conn. Ernest Hartford, 29 West Thirty-ninth Street, New York, vice-chairman.

Iron and Steel Institute. Sept. 9 to 11. Fall meeting, University of Birmingham, Birmingham, England. G. C. Lloyd, 28 Victoria Street, London, S. W. 1, secretary.

American Society for Steel Treating. Sept. 14 to 18. Seventh annual convention. Municipal Auditorium, Cleveland. W. H. Eisenman, 4600 Prospect Avenue, Cleveland, secretary.

Association of Iron and Steel Electrical Engineers. Sept. 14 to 19. Annual convention and exposition, Commercial Museum, Philadelphia. J. F. Kelly, 513 Empire Building, Pittsburgh, secretary.

American Electrochemical Society. Sept. 24 to 26. Fall meeting, Chattanooga, Tenn. Colin G. Fink, Columbia University, New York, secretary.

National Safety Council. Sept. 28 to Oct. 2. Annual meeting, Cleveland. W. H. Cameron, 168 North Michigan Avenue, Chicago, managing director.

October

American Gear Manufacturers' Association. Oct. 1, 2 and 3. Semi-annual meeting, West Baden Springs Hotel, West Baden, Ind. T. W. Owen, 2443 Prospect Avenue, Cleveland, secretary.

American Foundrymen's Association. Oct. 5 to 9. Annual meeting, State Fair Grounds, Syracuse, N. Y. C. E. Hoyt, 140 South Dearborn Street, Chicago, secretary.

American Welding Society. Oct. 21, 22 and 23. Fall meeting, Massachusetts Institute of Technology, Cambridge, Mass. M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb. 1.80c. to 1.90c.
F.o.b. Chicago, base, per lb. 2.10c.

Structural Shapes

F.o.b. Pittsburgh mill, base, per lb. 1.90c. to 2c.
F.o.b. Chicago, base, per lb. 2.10c.

Iron and Steel Bars

Soft steel bars, f.o.b. P'gh mills, base, per lb. 1.90c. to 2c.
Soft steel bars, f.o.b. Chicago, base, per lb. 2.10c.
Reinforcing steel bars, f.o.b. P'gh mills, per lb. 1.90c. to 2c.
Rail steel bars, f.o.b. Chicago and f.o.b. Chicago district mills, base, per lb. 2.00c.
Common iron bars, f.o.b. Chicago, base, per lb. 1.90c. to 2.00c.
Refined iron bars, f.o.b. P'gh mills, base, per lb. 3.00c.
Common iron bars, eastern Pa. mill, base, per lb. 2.10c.

Hot-Rolled Flats

Hoops, base (6 in. and narrower), per lb., Pittsburgh. 2.40c.
Bands, base (6 in. and narrower), per lb., Pittsburgh. 2.40c.
Strips, 6 in. and narrower, base, per lb., Pittsburgh. 2.40c.
Strips, wider than 6 in., base, per lb., Pittsburgh. 2.20c.
Strips, 6 in. and narrower, Chicago. 2.40c. to 2.50c.
Strips, wider than 6 in., Chicago. 2.30c. to 2.40c.
Cotton ties, per 45 lb. bundle, f.o.b. Atlantic ports. \$1.28
Cotton ties, per 45 lb. bundle, f.o.b. Gulf ports. 1.25

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb. 2.50c.
Screw stock and shafting, f.o.b. Chicago, base, per lb. 2.50c.
Screw stock, base, per lb., Cleveland. 2.55c.
Shafting, ground, f.o.b. mill, base, per lb. 2.80c. to 3.00c.
Strips, f.o.b. P'gh mills, base, per lb. 3.75c.
Strips, f.o.b. Cleveland mills, base, per lb. 3.75c.
Strips, delivered Chicago, base, per lb. 4.05c.
Strips, f.o.b. Worcester mills, base, per lb. 3.90c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg. \$2.65
Galvanized nails, 1-in. and longer, base plus. 2.00
Galvanized nails, shorter than 1 in., base plus. 2.25
Bright plain wire, base, No. 9 gage, per 100 lb. 2.50
Annealed fence wire, base, per 100 lb. 2.65
Spring wire, base, per 100 lb. 3.50
Galvanized wire, No. 9, base, per 100 lb. 3.10
Galvanized barbed, base, per 100 lb. 3.35
Galvanized staples, base, per keg. 3.35
Painted barbed wire, base, per 100 lb. 3.10
Polished staples, base, per keg. 3.10
Cement coated nails, base, per count keg. 1.85
Bale ties, carloads, to jobbers. 75, 15 and 5 per cent off list
Bale ties, carloads, to retailers. 75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers. \$65
Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant, and Duluth, Minn., mills \$2 a ton higher; Anderson, Ind., \$1 higher.

*F.o.b. Cleveland.

Sheets

Blue Annealed
(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh. 2.25c. to 2.30c.
Nos. 8 and 10 (base) per lb., f.o.b. Chicago dist. mills. 2.40c. to 2.45c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh. 3.10c. to 3.20c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill. 3.30c. to 3.35c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh. 4.20c. to 4.30c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill. 4.35c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh. 3.10c. to 3.20c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill. 3.25c. to 3.40c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. Pittsburgh. 4.25c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill. 4.60c. to 4.75c.

Tin Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills. \$5.50
Standard cokes, per base box f.o.b. Chicago district mills. 5.60
Standard cokes, per base box f.o.b. Elwood, Ind. 5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base	20-lb. coating I. C.	\$15.50	25-lb. coating I. C.	17.00
8-lb. coating I. C.	30-lb. coating I. C.	11.50	30-lb. coating I. C.	18.35
15-lb. coating I. C.	40-lb. coating I. C.	14.35	40-lb. coating I. C.	20.35

Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb. \$2.40 to \$2.50
Small, f.o.b. Pittsburgh. 2.60 to 2.65
Small, f.o.b. Pittsburgh. 70, 10 and 5 per cent off list
Small, Cleveland 70 and 10 to 70, 10 and 10 per cent off list
Small, Chicago 70, 10 and 10 per cent off list

Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton. \$43.00
Rails, light, billet, base, per lb. 1.60c. to 1.70c.
Rails, light rail steel, base, per lb. 1.50c. to 1.60c.
Spikes, 1/2 in. and larger, base, per 100 lb. \$2.80 to \$3.00
Spikes, 1/2 in. and smaller, base, per 100 lb. 3.00 to 3.25
Spikes, boat and barge, base, per 100 lb. 3.90 to 4.25
Track bolts, all sizes, base, per 100 lb. 2.35 to 2.40
Tie plates, per 100 lb. 2.75
Angle bars, base, per 100 lb. 2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
1/8	45	19 1/2	1/4 to 3/8	+11	+39
1/4 to 3/8	51	25 1/2	1/2	22	2
1/2	56	42 1/2	3/4	28	11
3/4	60	48 1/2	1 to 1 1/2	30	13
1 to 3	62	50 1/2			

Lap Weld

2	55	43 1/2	2	23	7
2 1/2 to 6	59	47 1/2	2 1/2	26	11
7 and 8	56	43 1/2	3 to 6	28	13
9 and 10	54	41 1/2	7 to 12	26	11
11 and 12	53	40 1/2			

Butt Weld, extra strong, plain ends

1/8	41	24 1/2	2 to 3	61	50 1/2
1/4 to 3/8	47	30 1/2	1/4 to 3/8	+11	+54
1/2	53	42 1/2	1/2	21	7
3/4	58	47 1/2	3/4	28	12
1 to 1 1/2	60	49 1/2	1 to 1 1/2	30	14

Lap Weld, extra strong, plain ends

2	53	42 1/2	2	23	9
2 1/2 to 4	57	46 1/2	2 1/2 to 4	29	15
4 1/2 to 6	56	45 1/2	4 1/2 to 6	28	14
7 to 8	52	39 1/2	7 to 8	21	7
9 and 10	45	32 1/2	9 to 12	16	2
11 and 12	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1 1/2 point, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and 2 1/2 per cent beyond the above discount.

NOTE—The above discounts on steel pipe also apply at Lorain, Ohio. Chicago district mills have a base 2 points less. Chicago delivered base 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel	Charcoal Iron
2 to 2 1/4 in. 27	1 1/2 in. +18
2 1/2 to 3 in. 37	1 3/4 to 1 1/2 in. +8
3 in. 40	2 to 2 1/4 in. —2
3 1/4 to 3 3/4 in. 42 1/2	2 1/2 to 3 in. —7
4 to 13 in. 46	3 1/4 to 4 1/2 in. —9

Beyond the above discounts, 5 to 6 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in. 60	3 in. 45
1 1/4 and 1 1/2 in. 52	3 1/4 to 3 1/2 in. 47
1 3/4 in. 36	4 in. 50
2 to 2 1/4 in. 31	4 1/2, 5 and 6 in. 45
2 1/2 and 2 3/4 in. 39	

Hot Rolled

2 and 2 1/4 in. 34	3 1/4 to 3 1/2 in. 50
3 1/2 and 2 3/4 in. 42	4 in. 53
3 in. 48	4 1/2, 5 and 6 in. 48

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing (New List)

Carbon 0.10 to 0.30 base. 50 to 55 per cent off list
Carbon 0.30 to 0.40 base. 45 to 50 per cent off list
Plus differentials for lengths over 18 ft. and for commercially exact lengths warehouse discounts on small lots range higher.

Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports	
Old range Bessemer, 51.50 per cent iron.....	\$4.55
Old range non-Bessemer, 51½ per cent iron.....	4.40
Mesaba Bessemer, 51.50 per cent iron.....	4.40
Mesaba non-Bessemer, 51.50 per cent iron.....	4.25
High phosphorus iron, 51.50 per cent.....	4.15
Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore	
Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus.....	45c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates.....	\$12.00 to \$13.00
Chrome ore, Indian basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f., Atlantic seaboard...	20.50 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₃ , New York.....	65c. to 70c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt.....	\$3.40 to \$3.75
Foundry coke, f.o.b. Connellsville prompt.....	4.50 to 5.00
Mine run steam coal, f.o.b. W. Pa. mines.....	1.50 to 2.10
Mine run coking coal, f.o.b. W. Pa. mines.....	1.65 to 1.90
Mine run gas coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.30 to 1.40
Gas slack, f.o.b. W. Pa. mines.....	1.50 to 1.70

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	115.00
Ferrosilicon, 50 per cent, delivered.....	82.50 to 85.00
Ferrosilicon, 75 per cent.....	145.00 to 147.50
Ferrotungsten, per lb. contained metal....	1.10 to 1.20
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr., delivered.....	11.50c.
Ferrovandium, per lb. contained vanadium	\$3.50 to \$4.00
Ferrocobaltititanium, 15 to 18 per cent, per net ton.....	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$32.00
Spiegeleisen, domestic, 16 to 19 per cent.....	31.00
Ferrosilicon, Bessemer, 10 per cent, \$33; 11 per cent, \$35; 12 per cent, \$37; electric furnace ferrosilicon, 10 per cent, \$38 furnace; 11 per cent, \$38; 12 per cent, \$39; 14 to 16 per cent, \$45.	
Silvery iron, 6 per cent, \$24; 7 per cent, \$25; 8 per cent, \$26; 9 per cent, \$27; 10 per cent, \$29; 11 per cent, \$31; 12 per cent, \$33.	

Fluxes and Refractories

Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, gravel, per net ton, f.o.b. Illinois and Kentucky mines.....	\$16.00
No. 2 lump, per net ton.....	19.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton....	15.00 to 16.00
Fluorspar, No. 1 ground bulk, 95 to 98 per cent calcium fluoride, not over 2½ per cent silica, per net ton, f.o.b. Illinois and Kentucky mines.....	32.50
Per 1000 f.o.b. works:	
Fire Clay	
Pennsylvania.....	High Duty \$43.00 to \$46.00 Moderate Duty \$40.00 to \$43.00
Maryland.....	48.00 to 50.00 43.00 to 45.00
Ohio.....	43.00 to 46.00 40.00 to 43.00
Kentucky.....	43.00 to 45.00 40.00 to 43.00
Illinois.....	43.00 to 45.00 40.00 to 43.00
Missouri.....	40.00 to 43.00 35.00 to 38.00
Ground fire clay, per ton.....	6.50 to 7.50
Silica Brick:	
Pennsylvania.....	40.00
Chicago.....	49.00
Birmingham.....	54.00
Silica clay, per ton.....	8.00 to 9.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	48.00

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

Machine bolts, small rolled threads, .60 and 10 per cent off list	
Machine bolts, all sizes, cut threads, 50, 10 and 10 per cent off list	
Carriage bolts, smaller and shorter, rolled threads, 50, 10 and 10 per cent off list	
Carriage bolts, cut threads, all sizes, 50 and 10 per cent off list	
Eagle carriage bolts.....	.65 and 10 per cent off list
Lag bolts.....	.60, 10 and 10 per cent off list
Flow bolts, Nos. 1, 2 and 3 heads.....	.50 and 10 per cent off list
Other style heads.....	.20 per cent extra

Machine bolts, c.p.c. and t. nuts, ½ x 4 in.

45, 10 and 5 per cent off list
Larger and longer sizes.....45, 10 and 5 per cent off list
Hot-pressed nuts, blank and tapped, square.....4c. off list
Hot-pressed nuts, blank or tapped, hexagons.....4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped.....4.10c. off list
Bolt ends with hot pressed nuts.....50, 10 and 10 per cent off list
Bolt ends with cold pressed nuts.....45, 10 and 5 per cent off list
Washers.....6.50c. to 6.25c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits)

Semi-finished hex. nuts:
¾ in. and smaller, U. S. S.....80 and 5 per cent off list
¾ in. and larger, U. S. S.....75 and 5 per cent off list
Small sizes, S. A. E.....80, 10, and 5 per cent off list
S. A. E., ¾ in. and larger.....75, 10 and 5 per cent off list
Stove bolts in packages.....80, 10 and 5 per cent off list
Stove bolts in bulk.....80, 10, 5 and 2½ per cent off list
Tire bolts.....50, 10 and 5 per cent off list

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)

(To jobbers and consumers in large quantities)

Per 100 Net		Per 100 Net	
S. A. E.	U. S. S.	S. A. E.	U. S. S.
¾-in.	\$0.44	¾-in.	\$2.35
¾-in. ....	.615	¾-in.	3.60
¾-in. ....	.62	¾-in.	5.65
¾-in. ....	.79	¾-in.	8.90
¾-in.	1.01	¾-in.	12.60
¾-in.	1.38	¾-in.	18.35
¾-in.	1.70	¾-in.	21.00

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws.....	80, 10 and 5 per cent off list
Milled standard set screws, case hardened, 80 and 10 per cent off list	
Milled headless set screws, cut thread, 80 and 10 to 80 per cent off list	
Upset hex. head cap screws, U. S. S. Thread, 80, 10, 10 and 5 per cent off list	
Upset hex. cap. screws, S. A. E. Thread, 80, 10 and 5 per cent off list	
Upset set screws.....	80, 10 and 10 per cent off list
Milled studs.....	.75 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$33.50 to \$35.00
Forging billets, ordinary.....	40.00
Forging billets, guaranteed.....	45.00
Sheet bars.....	35.00
Slabs.....	\$33.50 to 35.00
*Wire rods, common soft, base, No. 5 to ¾-in.....	45.00
Wire rods, common soft, coarser than ¾-in.....	\$2.50 over base
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp, grooved, per lb.....	1.90c.
Skelp, sheared, per lb.....	1.90c.
Skelp, universal, per lb.....	1.90c.

*Chicago mill base is \$46. Cleveland mill base, \$45.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E.	Series	Bar
Numbers		100 lb.
2100*	(½% Nickel, 10 to 20 per cent Carbon)	\$3.00 to \$3.25
2300	(3% Nickel)	4.50 to 4.75
2500	(5% Nickel)	5.75 to 6.00
3100	(Nickel Chromium)	3.50 to 3.65
3200	(Nickel Chromium)	5.00 to 5.25
3300	(Nickel Chromium)	7.50 to 7.75
3400	(Nickel Chromium)	6.25 to 6.50
5100	(Chromium Steel)	3.25 to 3.50
5200*	(Chromium Steel)	7.50 to 8.00
6100	(Chromium Vanadium bars)	4.25 to 4.50
6100	(Chromium Vanadium spring steel)	4.60 to 4.25
9250	(Silicon Manganese spring steel)	3.25 to 3.50
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium).....		4.00 to 4.25
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....		4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum).....		4.25
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....		3.75
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum).....		4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

Sept.	Copper, New York		Straits Tin (Spot) New York	Lead		Zinc	
	Lake	Electro- lytic*		New York	St. Louis	New York	St. Louis
2.....	14.75	14.50	56.55	9.75	9.37½	7.95	7.60
3.....	14.87½	14.50	57.00	9.70	9.37½	7.97½	7.62½
4.....	14.87½	14.50	57.75	9.60	9.25	8.02½	7.67½
5.....	14.87½	14.50	.....	9.60	9.25	8.02½	7.67½
8.....	14.87½	14.50	57.75	9.60	9.25	8.08½	7.72½

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Sept. 8.

The markets are generally quiet because of Labor Day. Buying of copper has improved and prices are higher. Speculative buying of tin has been fairly heavy. The lead market continues to grow easier and prices are declining. Pronounced strength features the zinc market.

Copper.—The speculative liquidation in foreign markets having disappeared early last week, the market here at once turned upward and has been stronger ever since. Consumers sensing the situation came into the market and were fairly heavy buyers previous to the holiday. Metal which was obtainable at 14.62½c., delivered, a week ago is now close to 14.87½c., delivered, there being some metal still available at 14.75c. Most producers are maintaining the higher quotation. Today the market is exceedingly quiet, due of course to the holiday yesterday, but the general situation is strong. Lake copper is quoted at 14.87½c., delivered.

Tin.—Previous to the holiday the tin market was fairly active, about 1000 tons changing hands. The entire business was between dealers, consumers still remaining out of the market. On Sept. 1 and 3 about 350 tons was sold on each day, with about 200 to 250 tons disposed of on Sept. 4. On Sept. 2 the market was entirely stagnant. Today the market has been dull with spot Straits quoted and sold at 57.75c., New York. The London market is somewhat bullish and prices there today were about £6 per ton higher than a week ago, with spot standard quoted at £256 5s., future standard at £258 15s. and spot Straits at £263 5s. The Singapore market yesterday was £264 15s. Arrivals thus far this month have been 410 tons, with 6810 tons reported afloat.

Lead.—The market is dull and decidedly easier. About the middle of last week lead was available at St. Louis at 9.37½c. and later the leading producer in that district reduced its price to 9.25c. The American Smelting & Refining Co. still maintains its contract price at 9.50c., New York. The situation is still somewhat mixed as to quotations, but a fair appraisal places the outside market at 9.25c., St. Louis, or 9.60c., New York. In the recent advance to higher prices production of lead has been stimulated, but consumption has not been reduced as might be expected. This has also been true of several similar movements in the past year or so.

Zinc.—Export inquiry has been quite active lately and has been an important factor in the advance to the higher levels to which slab zinc has recently gone. Heavier demand from galvanizers has been another factor. Quite as important has been the disinclination of producers to meet present prices. On the whole the market has a very firm undertone. Prime Western zinc for early delivery was quoted today at 7.70c. to 7.75c., St. Louis, or 8.05c. to 8.10c., New York.

Nickel.—Ingot nickel in wholesale lots is quoted at 34c., with shot nickel at 35c. per lb. Electrolytic nickel is quoted at 38c.

Antimony.—Chinese metal for spot delivery is a little higher at 17.12½c. to 17.25c., New York, duty paid, with September arrival quoted at about 16.75c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb., delivered.

Old Metals.—Business is slow and values generally unchanged. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	14.25
Copper, heavy and wire	13.25
Copper, light and bottoms	11.75
Heavy machine composition	10.25
Brass, heavy	8.75
Brass, light	7.75
No. 1 red brass or composition turnings	9.75
No. 1 yellow rod brass turnings	9.50
Lead, heavy	8.75
Lead, tea	7.25
Zinc	5.25
Cast aluminum	19.50
Sheet aluminum	19.50

Chicago

SEPT. 8.—Copper has declined slightly, whereas tin has advanced as the result of an increase in the London quotations. Lead has declined and antimony remains unchanged. No changes have taken place in the prices of old metals. We quote, in carload lots: Lake copper, 14.78c.; tin, 59c.; lead, 9.65c.; zinc, 7.70c.; in less than carload lots, antimony, 19c. On old metals we quote copper wire, crucible shapes and copper clips, 11.50c.; copper bottoms, 10c.; red brass, 9c.; yellow brass, 7.75c.; lead pipe, 8c.; zinc, 4.50c.; pewter, No. 1, 32.50c.; tin foil, 41c.; block tin, 46c.; all buying prices for less than carload lots.

WIRE MAKERS MERGE

Keystone-Kokomo Consolidation Represents 160,000 Tons Yearly Capacity in Plain Wire

Only the ratification by stockholders is now necessary to complete the merger of the Keystone Steel & Wire Co., Peoria, Ill., and the Kokomo Steel & Wire Co., Kokomo, Ind., brief note of which was made in these columns last week. First attempts at merging the companies, alike in products and serving the same trade, were made several years ago. Floyd A. Deahl, South Bend, Ind., has since submitted numerous proposals, the most recent having developed to a point where final consummation seems assured.

The Keystone company has three open-hearth furnaces, a 35-in. electrically driven reversing blooming mill, equipped to furnish ¾-in. billets; one Morgan semi-continuous rod mill, 183 wire-drawing blocks, 144 galvanizing blocks, 48 barbed-wire machines, 38 fence machines and 94 nail machines. The Kokomo plant also has three open-hearth furnaces and a 34-in. blooming mill, a Belgian rod mill, 202 wire-drawing blocks, 60 galvanizing blocks, 28 fence machines, 55 barbed-wire machines and 125 nail machines. Each has a capacity of 80,000 net tons of plain wire yearly.

President B. L. Sommer of the Keystone company stated that no announcement of the organization of personnel can be made yet, except that John E. Frederick, general manager Kokomo Steel & Wire Co., is the only one of the higher officials of that company who will be associated with the consolidation. Mr. Frederick will also be a member of the directorate. Headquarters of the consolidated company will be at Peoria.

Accidents to persons engaged in the manufacture of coke in the United States in 1924 resulted in 24 deaths and 1645 injuries, according to statistics compiled by W. W. Adams of the Bureau of Mines, Department of Commerce. The figures show a lower death rate and a lower injury rate for the coke industry than in any other year on record. Reports from operating companies show that 20,451 men were employed in the industry in 1924, and there was an average of 303 work days per man. The death rate was 1.16 per thousand men employed and the injury rate was 79.54. Injuries considered in this calculation are those causing disability beyond the remainder of the day or shift on which the accident occurred.

PERSONAL

Clarence Hayward, secretary and assistant treasurer Domhoff & Joyce Co., Cincinnati, and associated with the company for 25 years, has resigned. He will locate in Florida.

W. H. Stackhouse, general manager French & Hecht Co., Davenport, Iowa, has resigned because of ill health. He will move to Springfield, Ohio, about Oct. 1, in which city he formerly managed the plant of the French & Hecht Co.

Ben C. Holt, for several years connected with the Holt Harvester Co., Spokane, Wash., has resigned. He has not made plans for future business activities.

Dr. R. W. Woodward has resigned as chief metallurgist of the Whitney Mfg. Co., Hartford, Conn., to become associated with the Stanley P. Rockwell Co., consulting metallurgical engineer, Hartford. He will have charge of the department of the Rockwell company handling the Rockwell Dilatometer for precise heat treatment of steel, as well as being available for general consulting practice. Dr. Woodward was formerly chief of the section of mechanical metallurgy at the United States Bureau of Standards and has had a wide experience in the metallurgy of both ferrous and non-ferrous metals.

William Piez, Southern manager Concrete Steel Co., Birmingham, has been appointed, effective Sept. 1, district sales manager at Chicago, to succeed C. A. Lord, retired on account of ill health.

James F. Walsh, district sales manager at Chicago for the Moline Iron Works, Moline, Ill., for the past four years, has been elected a director.

OBITUARY

Silas J. Llewellyn

SILAS J. LLEWELLYN, president of the Interstate Iron & Steel Co. and the Chicago Malleable Castings Co., Chicago, died at his home in Evanston, Ill., Sept. 3, after having been in ill health for several months. His passing brought to a close an unusually long career devoted exclusively to the iron and steel business and closely paralleling the rapid growth of the industry in the Chicago district. Nearly 65 years of age at the time of his demise, Mr. Llewellyn had spent 46 years in the iron and steel trade, a record which is believed to exceed that of any other steel company executive in the West. When as a young man of 19 he entered the employ of the North Chicago Rolling Mill Co. plant at Milwaukee, the present Bay View works of the Illinois Steel Co., the rolling mill industry in the Chicago district was in its infancy. Today the capacity in that territory ranks a close second to that of the older Pittsburgh district.



SILAS J. LLEWELLYN

Mr. Llewellyn remained with the North Chicago Rolling Mill Co. and with its successor, the Illinois Steel Co., until 1897, latterly being stationed at Chicago. His next connection was with the Inland Iron & Forge Co., as vice-president. This company, which had a bar iron mill at East Chicago, Ind., was later merged into the Republic Iron & Steel Co., of which Mr. Llewellyn became secretary, with headquarters at Chicago. A year or two later he left the Republic company and was elected president of the Plano Mfg. Co., West Pullman, Ill., manufacturer of farm implements. Following the absorption of that company by the International Harvester Co., Mr. Llewellyn and associates formed the Interstate Iron & Steel Co. in 1905, purchasing the Emlyn Iron Works, East Chicago, Ind. The original capital stock was \$400,000 and the initial producing capacity was 50,000 tons of bar iron and steel per annum. Today the company's assets total more than \$10,000,000, while its capacity is 350,000 tons of steel and iron per year.

The growth of the organization was first evidenced

in the enlargement of the original works at East Chicago. In 1913 the company purchased a rail rerolling mill at Cambridge, Ohio, and when this plant was destroyed by fire in 1916, it was rebuilt at Marion, Ohio. The Marion plant was sold in 1919. In December, 1916, the Interstate company acquired the Grand Crossing Tack Co., which consisted of a wire plant at 7850 South Chicago Avenue, Chicago, and a steel works at 118th Street and Calumet River, South Chicago. These plants have been materially enlarged. In 1921 a new Morgan continuous and staggered duotype bar mill was completed—one of the first mills designed and constructed especially for rolling alloy steel bars. In entering the alloy steel field on a large scale, Mr. Llewellyn showed keen foresight of the later expansion in demand for this type of metal in the automotive and other industries.

Mr. Llewellyn was born in Briton Ferry, Wales, Oct. 25, 1860, and was brought to this country by his parents in 1864. He was educated in the public schools of Milwaukee. Having risen from the bottom of the ladder through his own efforts, he was a man of unusual force; yet he retained a keen appreciation of the problems of all his associates, whether high or low in the economic scale, and was ever kindly and sympathetic in his relations with them.

Emil Frederick Axner

EMIL FREDERICK AXNER, manager raw materials department Hickman, Williams & Co., Chicago, died at his home in that city

Sept. 4, following an extended illness. Having been identified with the merchandising of pig iron and allied commodities during his entire business career, Mr. Axner had a record of service in that field of business equalled by few others. He had an unusually wide acquaintanceship among industries in Chicago and tributary territory and the magnetism of his personality, together with the genuineness of his unfailing cordiality, earned fast friends for him among all who knew him. By virtue of his long experience and a bent for keen observation and careful analysis he was one of the best informed men in his vocation. He was 51 years old, having been born in Chicago, Aug. 22, 1874. His first connection with the pig iron trade dates back to his boy-



E. F. AXNER

hood days when he entered the service of the Foster-Waterbury Co., now the Iroquois plant of the Youngstown Sheet & Tube Co., as a messenger between the furnaces at South Chicago and the general offices at Chicago. He remained with that organization until 1900 when he joined the Chicago sales force of the Matthew-Addy Co., pig iron broker. His service with that company lasted until 1909, when he took charge of pig iron sales for the Illinois Steel Co., Chicago. In addition to selling the merchant pig iron output of that organization, he also had charge of the sale of merchant pig iron of the Tennessee Coal, Iron & Railroad Co. in the Chicago district. In September, 1919, he severed his connection with Illinois Steel Co. and became an officer of the Aetna Ball Bearing Co., Chicago. On Oct. 14, 1920, he became identified with Hickman, Williams & Co. at Chicago, as manager raw materials department, a position he held up to the time of his death. He was a charter member of the Chicago Foundrymen's Club.

B. W. M. Hanson

BENGT W. M. HANSON, president of the Hanson & Whitney Machine Co., Hartford, and inventor and mechanical engineer of wide repute, died at his home, 122 Tremont Street, Hartford, Sept. 6. He had been in failing health for several years, but attended to his duties at the Hanson-Whitney company until a few weeks ago.



B. W. M. HANSON

He was born in Sweden in 1866. Upon coming to America in 1890, he entered the employ of the Waltham Watch Co., being engaged in the design and improvement of watch making machinery. Five years later he started work with the Pratt & Whitney Co., Hartford, beginning at the bench in the small tool department and advancing through various executive positions until he became works manager and vice-

president of the company.

In 1915, after leaving the Pratt & Whitney Co., Mr. Hanson served with distinction as a civilian member of the machine gun board of the War Department. He was given charge of the gun production at the Colt Patent Fire Arms Mfg. Co., Hartford, during the critical stage of the World War. He was elected as vice-president and general manager of the company, holding this position for about three years. Later he opened an engineering bureau for experimental work and in 1920 he became president of the Hanson-Whitney Co., a new enterprise. His associate was Clarence E. Whitney, president of the Whitney Mfg. Co., Hartford. The taps, gages, machine tools and processes employed in their production are the inventions of Mr. Hanson.

He was a director of the S. K. F. Ball Bearing Co., and was a member of the American Society of Mechanical Engineers, a former president of the Manufacturers Association of Hartford County, a member of the Hartford Chamber of Commerce and the Connecticut Chamber of Commerce. He was also a member of the Hartford Club and the Farmington Country Club. He made a deep impression on the machine tool industry, both personally and through his contributions to its physical progress. His wife; a son, Einar A. Hanson, and a daughter, Svea H. Hanson, survive him.

DEXTER P. DONELSON, formerly president Continental Bolt & Iron Works, Chicago, prior to its acquisition by the Gary Screw & Bolt Co., Gary, Ind., died Sept. 3, while on a visit to California. For the last year he had made his home in Pasadena because

of ill health, but at the time of his death was making plans for his return to Chicago.

EDWARD R. STETTINIUS, member of the firm of J. P. Morgan & Co., who died at Locust Valley, Long Island, Sept. 3, aged 60 years, first became known in the iron and metal-working trades at Chicago in the early eighteen-nineties, when he was treasurer of the Stirling Boiler Co. The plant was at Barberton, Ohio. In 1906 this company was consolidated with the Babcock & Wilcox Co., of which Mr. Stettinius became vice-president. In the same year he was made vice-president of the Diamond Match Co., New York, and three years later became its president, succeeding Ohio C. Barber. His work for J. P. Morgan & Co. as buyer of all supplies purchased in the United States for the Allies in 1915-17 was one of the prodigies of the financial and manufacturing phases of wartime history. After this country entered the war he went to Washington as Surveyor-General of War Supplies for the War Department, a member of the War Council and Second Assistant Secretary of War.

EUGENE DE WITT, for several years president of the Puget Sound Iron & Steel Works, Tacoma, Wash., died at his home in that city recently, aged 47 years. He was active in industrial circles and also in civic work.

JOSEPH MITCHELL, president John Williams, Inc., iron works and bronze manufacturer, Plainfield, N. J., died at his home in that city on Sept. 5. He had spent his entire life, except a brief period in his youth, with the firm of which he was head. Mr. Mitchell formerly was a member of the board of governors of the Building Trades Employers' Association, New York.

Fabricated Steel Buildings Recommended for Zones Subject to Earthquakes

LOS ANGELES, Sept. 3.—The first official report of the American Society of Civil Engineers on the results of a comprehensive survey of construction in Santa Barbara, will be released shortly, according to J. D. Galloway, prominent San Francisco consulting engineer and chairman of the National Committee of Earthquakes of the society. The theme of Mr. Galloway's report to the organization will be that elasticity is the keynote of sound construction.

"The only two steel frame buildings in the entire quake zone, the Santa Barbara post-office and the Christian church, were undamaged," Mr. Galloway declared, "which again proves the conclusions reached by engineers following the San Francisco disaster in 1906, that elasticity of construction is the outstanding need to withstand earthquake shock.

"In San Francisco, the building ordinance states that structural steel must be used for all construction over eight stories. This ordinance was based upon the best information available immediately following the San Francisco disaster. In my report to the American Society of Civil Engineers, based upon all of the evidence now before us, it will be recommended that this limit be greatly reduced."

That Santa Barbara property owners are thoroughly aware of the significance of the performance of the various types of construction in the earthquake, is shown in the choice of structural steel framework for the majority of the buildings erected since the disaster in June or planned for immediate construction. More than \$2,000,000 in steel-framed buildings have already been announced, including the following:—a new \$1,000,000 county court house, to be built on the site of the present badly-damaged structure; a new general hospital; an all-steel sub-station for the California Edison Co., to cost approximately \$300,000; two hotels; an office building; and a structure to house an automobile concern, to be built for the Bothin Estate at a \$200,000 cost; a \$125,000 First National Bank Building; the Mission Theater, the largest in the city; and a new Californian Hotel, replacing the old demolished structure, to cost more than \$100,000.

Machinery Markets and News of the Works

INQUIRIES INCREASING

Outlook for the Machine Tool Trade Appears More Encouraging

Dayton Company Buys 16 Lathes—Detroit Automobile Company in Market for 20 Turret Lathes

CONSIDERING that a holiday week usually slows up machine tool business, the past week has been fairly good. There has been a sharp increase in the number of inquiries and as these come from many sources the expectation in the trade is that this month will bring a substantial improvement in the volume of machinery buying.

Much of the current business springs from automo-

bile companies or parts makers. A Detroit automobile company is in the market for 20 turret lathes. Dodge Brothers and the A. C. Spark Plug Co., the latter of Flint, Mich., are buying tool room equipment.

Railroad buying has not been very active, but more business is expected from that source shortly. Radio manufacturers are inquiring for shop equipment as the season for greatest radio sales approaches.

One of the encouraging developments is an increase in both orders and inquiries from New England, particularly Connecticut, that section having been very dull for some time.

It is reported in Detroit that the Ford Motor Co. will offer for sale about \$1,000,000 worth of used wood-working machinery as a result of the adoption of an all-steel automobile body.

New York

NEW YORK, Sept. 8.

INQUIRIES are more plentiful and the trade is quite hopeful that this month will bring an improvement in the volume of buying. Most of the inquiries are for single machines or lots of two or three, but they spring from many sources, thus indicating that the metalworking industries generally are expecting a better business this fall. There has been a lack of transactions of importance during the past week, but it is the belief that considerable buying had merely been put off until after Labor Day. The Boston & Albany Railroad bought a 6-ft. radial drill from the Niles-Bement-Pond Co. The American Steel & Wire Co. bought a 44-in. side head boring mill.

Manual training equipment will be installed in the two-story junior high school on Delaware Avenue, Albany, N. Y., estimated to cost \$900,000, for which bids are being asked on a general contract. Marcus T. Reynolds is architect.

Steinway & Sons, 109 West Fifty-seventh Street, New York, have plans for a six-story piano factory, 200 x 360 ft., at Long Island City, forming an addition to its No. 2 plant, estimated to cost \$750,000 with machinery. W. H. Benedict, 371 Fulton Street, Brooklyn, is architect.

The Standard Oil Co. of New York, 26 Broadway, will erect a three-story automobile service, repair and garage building, 150 x 170 ft., at Albany, N. Y., for company trucks and cars, to cost \$175,000 with equipment.

The Crane Co., 836 North Michigan Avenue, Chicago, has awarded a general contract to the Willcox Construction Co., Long Island City, for its two-story factory branch and distributing plant at 33-43 Debevoise Place, Brooklyn, 100 x 120 ft., estimated to cost \$100,000 with equipment. Raymond Hood, 18 East Forty-first Street, New York, is architect.

Fire, Sept. 1, destroyed a portion of the piano factory of F. Radle, 609-13 West Thirty-sixth Street, New York, with loss estimated at \$100,000 including equipment. Plans for rebuilding are under advisement.

The General Motors Corporation, 224 West Fifty-seventh Street, New York, has acquired a controlling interest in Austin Motors, Ltd., Birmingham, England, manufacturer of light and high-powered automobiles, and will operate in conjunction with its other properties in that country. The works will be expanded and the present assembling plant of the purchasing company at Hendon, near London, consolidated with the Austin plant at Birmingham. Alfred P. Sloan, Jr., is president.

The Vacuum Oil Co., 61 Broadway, New York, has filed plans for a two-story distributing plant, 94 x 190 ft., at 475-99 East Tenth Street, to cost approximately \$160,000. George P. Whaley is president.

The Packard Motor Car Co. of New York, Broadway and Sixty-first Street, has acquired 20 city lots at Broadway and Sherman Avenue, Bronx, and plans the early erection of a two-story and basement service, repair and factory branch, to cost more than \$150,000 with equipment.

Patrick Murphy, New York, operating a wood-working plant at 573 Walton Avenue, has plans for a one-story factory, 93 x 100 ft., at Austin Place and 144th Street, to cost \$27,000. Moore & Landseidel, Third Avenue and 148th Street, are architects.

The Albany Grease Co., 708 Washington Street, New York, manufacturer of lubricating oils, etc., has plans for extensions in its one and two-story plant at Rahway, N. J., to cost \$50,000.

The International Motor Co., 25 Broadway, New York, has engaged Stone & Webster, Inc., 147 Milk Street, Boston, to design and construct a two-story addition to its plant at South Plainfield, N. J., 68 x 275 ft.

The Kimball Glass Co., Vineland, N. J., manufacturer of laboratory glassware, etc., has awarded a general contract to the W. P. Cameron Engineering Co., Packard Building, Philadelphia, for a three-story and basement addition, 90 x 110 ft., to cost \$80,000 with equipment.

The Northern New Jersey Oil Co., 56 Central Avenue, Orange, N. J., has applied for permission to construct a pipe line in the Passaic River at its property at North Newark.

Officials of the Fokker Aircraft Co., Hasbrouck Heights, N. J., are said to be arranging for the organization of a new company to establish a plant at Kansas City, Mo. The local Hasbrouck Heights works will be continued as a branch.

The Board of Education, Netcong, N. J., is considering the installation of manual training equipment in its proposed two-story and basement high school, estimated to cost \$100,000, for which foundations will soon be laid. Rasmussen & Wayland, 36 West Forty-seventh Street, New York, are architects.

Frank S. Nute, 156 East Forty-second Street, New York, architect, has filed plans for a three-story automobile service, repair and garage building, 48 x 200 ft., at 701-19 First Avenue, to cost \$100,000 with equipment.

The Murdoch Machine Corporation, 101 Park Avenue, New York, has been incorporated with \$150,000 to manufacture dish washing machines. Operations will be done by contract. H. S. Hart is president.

Detroit

DETROIT, Sept. 8.

AN expansion program has been arranged by the General Motors Corporation, Detroit, at its malleable iron works at Saginaw, Mich., estimated to cost \$850,000. The work will include buildings and machinery to double the present capacity.

The James Motor Valve Co., Detroit, manufacturer of

The Crane Market

WHILE there is a large volume of business pending, prospective purchasers are slow to place orders. One of the sizable lists being closed at present is from the American Steel & Wire Co. for a total of 107 small capacity box stripping cranes for various plants. The list includes 27 for Worcester, Mass., 21 for Braddock, Pa., 32 for the Consolidated works in Cleveland and 2 for the H. P. works in the same city, 16 for the De Kalb works and 9 for New Haven, Conn. In large overhead equipment, the Delaware, Lackawanna & Western Railroad is understood to be asking for preliminary estimates on a gantry crane of 10, 20 or 30 tons capacity. There are a sizable number of locomotive crane inquiries but few awards. Louis E. Emerman & Co., Keowee Street, Dayton, Ohio, are in the market for a 20-ton, 70 to 90-ft. span used overhead traveling crane for yard use.

In the Pittsburgh district the Carnegie Steel Co. has taken bids on a number of cranes for its Homestead and Duquesne works and the orders will probably be distributed in the next two weeks. The Ford Motor Co. has placed several cranes with an Alliance, Ohio, builder.

Among recent purchases are:

Whitehall Cement Co., Philadelphia, a 20-ton electric traveling crane from the Whiting Corporation.

Central Leather Co., New York, a 5-ton locomotive crane from the American Hoist & Derrick Co.

Gulfport Creosoting Co., Gulfport, Miss., reported to have purchased three 15-ton locomotive cranes from the American Hoist & Derrick Co.

New York Central & Hudson River Railroad, a 15-ton, 45-ft. 9-in. span hand power crane for power house at Avis, Pa., from the Niles-Bement-Pond Co.

Ackerman & Russell, Troy, N. Y., a 25-ton used Industrial locomotive crane from Philip T. King, New York.

Rosenthal Engineer Contracting Co., Brooklyn, N. Y., a 10-ton crawl tread, gasoline driven locomotive crane from the Brown Hoisting Machinery Co.

American Cast Iron Pipe & Foundry Co., Birmingham, a 5-ton, 28-ft. span, two 5-ton, 35-ft. span and two 5-ton, 40-ft. span cranes from the Niles-Bement-Pond Co.

automobile parts, is planning for extensions, and the installation of general machine equipment.

The Hudson Motor Car Co., 12601 East Jefferson Avenue, Detroit, has engaged Albert Kahn, Inc., Marquette Building, Detroit, architect and engineer, to prepare plans for a proposed six-story addition.

The Owosso Ice & Fuel Co., Owosso, Mich., will soon begin the construction of a one-story ice-manufacturing plant, with an initial daily output of 60 tons.

The Chrysler Motor Corporation, Massachusetts Avenue, Detroit, has acquired the local plant of the American Motor Body Corporation, 12262 Kerchville Street. It will be remodeled for an addition to the body-building departments of the purchasing company. Walter P. Chrysler is president.

The Board of Clinton County Road Commissioners, St. Johns, Mich., plans the installation of machine tools and other general machine equipment in a new building now being completed.

The Gottfredson Truck Corporation, 3579 Gratiot Avenue, Detroit, manufacturer of motor trucks, will ask bids within the next week or awo for a three-story addition to its plant at Wayne, Mich., 80 x 540 ft. Carey & Esselstyn, Hoffman Building, are architects. Benjamin Gottfredson is president.

The Jackson Motor Shaft Co., Jackson, Mich., has awarded a general contract to John F. Braun, Jackson, for a one-story addition, totaling about 14,000 sq. ft., to cost \$150,000 including machinery. It is expected to be ready for service in November.

The Fisher Body Corporation, General Motors Building, Detroit, is completing plans for an addition to its works at Flint, Mich.

The Acme Brass Works, Inc., Holland, Mich., has arranged for the installation of a brass forging department to develop a capacity of about 2500 forgings per day. The present equipment will be increased with two additional hammers and auxiliary apparatus.

The Simplicity Engineering Co., Durant, Mich., has been incorporated with \$150,000 capital stock to manufacture screen devices and conveying equipment. All operations will be conducted at its plant with the exception of steel pulleys and castings. It will be in the market for raw materials, including steel, and machine tools. Louis E. Soldan is one of the principals.

The United Stove Co., Ypsilanti, Mich., has acquired the Michigan Crown Fender Co. and will make improvements to the plant and purchase additional machinery, including toggle drawing presses, double seamers, screw machines and other equipment. Louis T. Wilcox, Peckskill, N. Y., is president of the stove company.

E. R. Rice, 662 Warren Avenue, Detroit, is inquiring for surplus stocks of grinding wheels.

Buffalo

BUFFALO, Sept. 7.

CONTRACT has been awarded by the Rice & Adams Corporation, 180 Chandler Street, Buffalo, manufacturer of dairy machinery, etc., to the H. K. Ferguson Co., Cleveland, for a new plant at Tonawanda, N. Y., including steam power house, to cost \$125,000 with equipment. O. Adams is general manager.

Fire, Sept. 1, destroyed a portion of the asbestos shingle manufacturing plant of the Lockport Paper Co., Mill and Frost Streets, Lockport, N. Y., with loss of more than \$100,000 including machinery. It is planned to rebuild.

The Municipal Board, Potsdam, N. Y., is asking bids until Sept. 15 for motor-driven pumping machinery and accessory equipment for a proposed municipal pumping station and filtration plant. Bogart & Pohl, 30 Church Street, New York, are engineers.

The Board of Education, Frankfort, N. Y., plans the installation of manual training equipment in a proposed two-story high school to cost \$110,000, for which plans will soon be ready for bids. Kinne & Frank, 7 Hopper Street, Utica, N. Y., are architects.

J. B. Wise, Inc., Mill and Moulton Streets, Watertown, N. Y., manufacturer of brass plumbing specialties, etc., is said to be arranging for the early rebuilding of the portion of its foundry recently destroyed by fire, with loss in excess of \$50,000 including equipment. L. B. Mitchell is president.

Fire, Sept. 2, destroyed a portion of the plant of the Brown Paper Mill Co., Ithaca, N. Y., with loss estimated at \$40,000 including equipment.

The A. & J. Mfg. Co., Binghamton, N. Y., manufacturer of aluminum ware, is said to be considering a two-story addition, 96 x 100 ft., with connecting tunnel to present building. E. H. Johnson is in charge.

The O. W. Pierce Co., Olean, N. Y., is in the market for an 8-ft. power press brake, preferably motor drive.

William P. Murphy, Bath, N. Y., has acquired a local building and will remodel for a garage and service station. A drill press, lathe, reboring mill and other equipment will be required.

Charles F. Hacker, 211 Lux Street, Rochester, N. Y., is reported in the market for enameling and japanning equipment.

Chicago

CHICAGO, Sept. 7.

INCREASED interest on the part of machine tool buyers is indicated by a further expansion in the number of inquiries. The prospective purchasers represent diverse industries and although most inquiries are small, covering one of two machines, the total amount of pending business is large in the aggregate. Manufacturers of radio equipment are quite active, being interested in punch presses and automatic screw machines. Fairbanks, Morse & Co., Chicago, are in the market for a milling machine for its Beloit plant. The Nash Motors Co. bought several machine tools for its Milwaukee plant and is now making inquiry for a 6-in. cold saw. The city of Milwaukee is inquiring for a 24-in. shaper and a No. 3 universal milling machine. Railroad buying has been very light. It is believed that the Chicago, Milwaukee & St. Paul has finally completed purchases against its list. The Illinois Central has bought a 30-in. and a 24-in. lathe, both motor-driven. The Santa

Fe has closed for one 32-in. crank planer, and it is understood that an inquiry for a similar machine is still pending. The largest new inquiry in the market is a list of six items for the Youngstown Sheet & Tube Co., Chicago, which is as follows: 3 lathes, 18-in., 24-in. and 36-in., respectively; a planer; a 5-ft. radial drill, and a 16-in. boring mill. All of the machines are to be motor-driven.

The Barber-Colman Co., River and Loomis Streets, Rockford, Ill., has awarded a contract for the construction of a plant addition to cost \$40,000.

The Kentucky Power Co., Augusta, Ky., has completed plans for an addition to its local steam-operated electric power plant, with the installation of additional equipment.

J. Henton, highway commissioner, Portage, Wis., has awarded a contract for the construction of a machine shop, to cost \$20,000.

The Ohio Edison Co., Springfield, Ohio, has plans under way for a new steam-operated power plant, initial capacity 26,000 hp., to cost in excess of \$1,500,000.

The Kansas Gas & Electric Co., Wichita, Kan., has purchased a site for the construction of a one-story electric power sub-station, to cost \$80,000.

The Board of City Trustees, Newport, Cal., contemplates the installation of pumping equipment and other improvements in connection with a proposed municipal water works. A special election has been called for Sept. 10 to approve bonds for \$350,000.

The Superior Ship Building Co., Superior, Wis., is making improvements and alterations at its local yards, to cost \$50,000.

The North Nebraska Power Co., Kearney, Neb., announces that construction will soon be started on a hydro-electric plant on the Niobrara River, near Spencer, Neb., to cost \$500,000.

The Royal Steel Co., Chicago, has leased a portion of the building now being constructed at 5300 West Sixty-sixth Street, Clearing Industrial District, totaling 13,000 sq. ft., for a new plant.

The Chicago Hardware Foundry Co., 549 West Washington Street, Chicago, has awarded contract for a one-story foundry, 40 x 60 ft., at North Chicago, to E. L. Archibald Co., Inc., 111 West Washington Street. R. E. Pingrey & Co., 134 South La Salle Street, are architects.

The Standard Oil Co., Decatur, Ill., has awarded contract to the Moore Brothers Construction Co., East St. Louis, Ill., for a one and two-story distributing plant, machine shop and service and repair garage building, at East St. Louis, to cost approximately \$150,000 with machinery. Schlinz & Bailey, Monadnock Building, Chicago, are engineers.

Fire, Aug. 29, destroyed a portion of the plant of the Cutler-Magner Lime Co., Eighth Avenue, Duluth, Minn., including kilns and other equipment, with loss estimated at \$100,000. Plans for rebuilding are under consideration.

The Board of Education, Marshalltown, Iowa, plans the installation of manual training equipment in its two-story and basement high school, estimated to cost \$325,000, for which bids are being asked on a general contract until Sept. 22. Dougher, Rich & Woodburn, Valley National Bank Building, Des Moines, Iowa, are architects.

The Dearborn Chemical Co., 1029-37 West Thirty-fifth Street, Chicago, has begun an expansion program to cost about \$150,000. The work will include the installation of additional power equipment, comprising boilers, engine, ash-handling machinery, electric generator, switchboard and auxiliary apparatus.

The Board of Education, Falls City, Neb., plans the installation of manual training equipment in its proposed three-story high school, estimated to cost \$250,000, for which bids have been asked on a general contract. Fiske, Maginnis & Schaumberg, Lincoln, Neb., are architects.

The American Vault Works, Inc., 11128 South Rockwell Street, Chicago, has awarded a general contract to Harper & Buttendorf, 1028 North Oak Boulevard, Oak Park, Ill., for a one-story and basement addition, 175 x 320 ft., to cost about \$150,000. Harold A. Zochert is manager.

The Alexander Aircraft Co., Alexander Industries Building, Denver, has been organized as a subsidiary of the Alexander Industries, and will manufacture airplanes. It has an established plant, but is contemplating a new building and will be in the market for the necessary material, including steel tubes. W. G. Helnick is secretary to the president.

Philadelphia

PHILADELPHIA, Sept. 7.

CONTRACT has been let by the Certainfeed Products Corporation, Second Street and Erie Avenue, Philadelphia, manufacturer of roofing, etc., to Stofflet & Tillotson,

Wesley Building, for one and three-story additions, 70 x 150 ft., 20 x 230 ft., and 45 x 90 ft., to cost more than \$200,000 with equipment.

The Philadelphia Grain Elevator Co., Pier B, Port Richmond, Philadelphia, a subsidiary of the Reading Co., will increase its capital from \$480,000 to \$1,500,000, and create a mortgage debt of \$3,000,000, the fund to be used for the construction of a new steel grain elevator at Port Richmond, with a capacity of 2,500,000 bu.

The Haines, Jones & Cadbury Co., 1136 Ridge Avenue, Philadelphia, manufacturer of plumbers' brass goods, etc., has acquired property at Roosevelt Boulevard and Palethorp Street and is reported to be considering a new plant.

The Pennsylvania Railroad Co., Philadelphia, has asked bids for a group of shop buildings at Fiftieth and Merlon Streets, to cost in excess of \$75,000 with equipment. William H. Cookman is company architect.

The Bureau of Supplies and Accounts, Navy Department, Washington, is asking bids for 100 hydraulic pressure gages for the Philadelphia Navy Yard, schedule 4313.

The Leeds & Lippincott Co., Atlantic City, N. J., operating the Chalfonte-Haddon Hall Hotels, has plans for a power house, 75 x 125 ft., to cost about \$200,000 with equipment. The Stewart A. Jellett Co., Twelfth and Locust Streets, Philadelphia, is engineer.

J. F. Seeley, 349 Wyoming Avenue, Wyoming, Pa., has plans for a two-story automobile service, repair and garage building, 67 x 130 ft., to cost \$80,000 with equipment.

The City Council, Reading, Pa., is considering the installation of additional pumping machinery in connection with extensions in the municipal sewage system, for which a portion of a proposed bond issue of \$2,000,000 will be used. The city engineer is in charge.

The Board of Education, Duryea, Pa., plans the installation of manual training equipment in its proposed two-story and basement high school, estimated to cost \$250,000, for which superstructure will soon begin. Frank J. Miller, Brooks Building, Scranton, Pa., is architect.

The Phoenix Utility Co., Allentown, Pa., operated by the Electric Bond & Share Co., 71 Broadway, New York, will soon begin the construction of an addition to the power plant of the Pennsylvania Power & Light Co., Allentown, an affiliated organization, in the vicinity of Pine Grove, Pa., to cost more than \$2,500,000.

The Kirsch Mfg. Co., Sturgis, Mich., manufacturer of curtain rods, upholstery hardware, etc., has leased a portion of the building, at 600 East State Street, Trenton, N. J., for an Eastern factory branch and distributing works.

The Peerless Spring Mfg. Co., Philadelphia, manufacturer of various kinds of springs, clips, pliers, punches, dies, etc., has bought a new plant which will be made permanent headquarters. Offices are located at 2626-56 Martha Street and the factory at 2626-55 Collins Street. Alterations have been started in the new factory.

Latrobe Electric Steel Co., Latrobe, Pa., plans extensions to cost \$200,000, one of the new buildings to require two cranes.

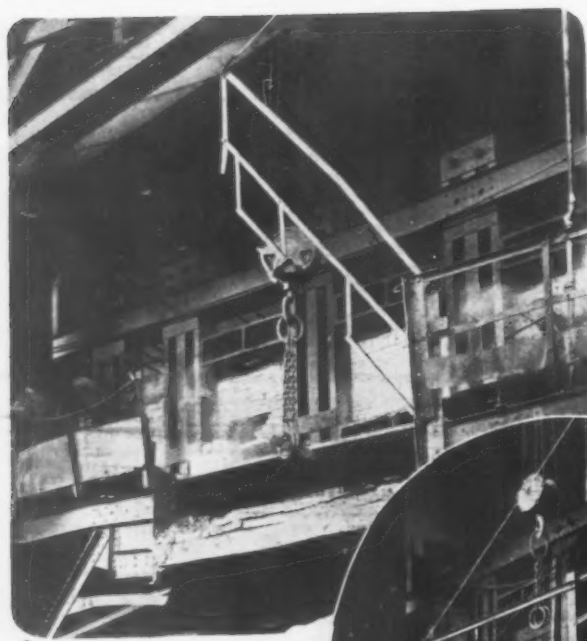
Cleveland

CLEVELAND, Sept. 7.

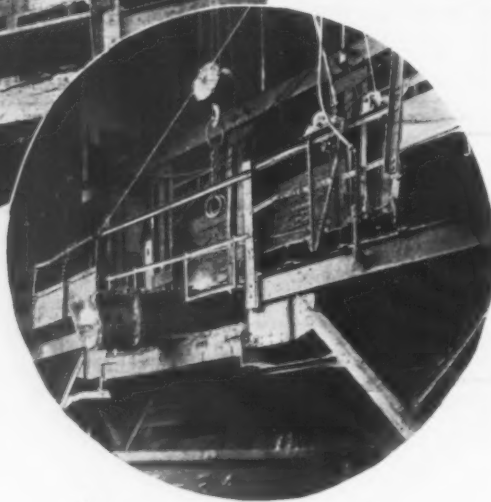
THE machinery market was rather quiet during the week but some local dealers report an improvement in small lot inquiries and look for an increased volume of business in September. While the heavy buying has subsided in the automotive industry, there is still a fair amount of activity in the Detroit territory. Dodge Brothers, Detroit, and the A-C Spark Plug Co., Flint, Mich., are buying tool room equipment and a Detroit automobile company has an inquiry out for 20 turret lathes. Word comes from Detroit that the Ford Motor Co., having substituted steel for wood in the manufacture of automobile bodies, will shortly place on the market \$1,000,000 worth of wood-working machinery. A local manufacturer of turret lathes received single machine orders from Belgium and England the past few days. The Woods Engineering Co., Alliance, Ohio, is inquiring for a bolt cutter.

The plant and equipment of the Hamilton Machine Tool Co., Hamilton, Ohio, will be sold at auction Sept. 15 under court order. The equipment includes 10 planers, 21 lathes and about 25 other machines of various types.

The Lakewood Engineering Co., Berea Road, Cleveland, manufacturer of factory trucks and contractors' equipment, has placed a general contract with the Austin Co., for a



While the Safety Gate Is Normally Down, as in the Circular View, It May Be Lifted Out of the Way, as Above, to Permit the Crane to Work, or For Any Other Purpose



Railing Protects Open-Hearth Workers from Falling into Pit

New backstanding safety railings have recently been installed in the Middletown open-hearth department of the American Rolling Mill Co., Middletown, Ohio. Designed to prevent an accidental fall from the backstanding into the pit below, they were developed by William Bush of the open-hearth mechanical maintenance section.

Fig. 1 shows the collapsible railing partially lifted to the vertical position, where it is entirely out of the way during the placement of the runner or other heavy equipment or material on the backstanding. Since it is loose-jointed, it is a simple matter to raise and lower the railing by means of a light cable extending from the end, up through a sheave attached to the crane runway and thence down to a small winch conveniently placed on the building column.

The upper horizontal member was placed sufficiently high to protect the brickmasons against a fall from their scaffold while laying backwalls on the furnace. This scaffold appears in the first photograph.

Fig. 2 shows the railing in the protective position, with the brickmason's scaffold removed and the runner in place, affording complete protection to furnace men while at work on the tap hole or engaged in lining the steel runner, or in cleaning it out after a heat.

one-story brick and steel factory, 62 x 120 ft. Lloyd Brown is president.

The Draper Mfg. Co., East Ninety-first Street, Cleveland, manufacturer of steel barrels and drums, has awarded contract with the George A. Rutherford Co., 2725 Prospect Avenue, Cleveland, for a one-story factory, 100 x 110 ft. The W. S. Ferguson Co., 1900 Euclid Building, is architect and engineer. C. T. Draper is president and general manager.

The Bingham Stamping Co., Toledo, Ohio, has contracted with William Grambling, 1417 Detroit Avenue, Cleveland, for an addition to its boiler house.

Indiana

INDIANAPOLIS, Sept. 8.

FIRE, Aug. 25, destroyed a portion of the plant of the Millersburg Handle Co., Millersburg, Ind., with loss estimated at \$25,000 including equipment.

McGuire & Shook, Indiana Pythian Building, Indianapolis, architects, will take bids around the last of the month for a three-story and basement automobile service, repair and garage building, 75 x 150 ft., estimated to cost \$250,000.

The Board of Education, Greenfield, Ind., plans the installation of manual training equipment in its proposed one-story high school to cost about \$120,000, for which superstructure will soon be placed under way. Omer P. Gordon, Chayer Building, is architect.

The Gates Mfg. Co., Indianapolis, manufacturer of automobile tops and equipment, is considering plans for rebuilding the portion of its works destroyed by fire Aug. 28, with loss estimated at \$200,000 including machinery.

The Midland Utilities Co., Gary, Ind., is disposing of a preferred stock issue of \$2,500,000, a portion of the proceeds to be used for extensions and improvements in power plants and system. Samuel Insull is president.

The Board of School Trustees, Waterloo, Ind., plans the installation of manual training equipment in its two-story and basement high school, estimated to cost \$95,000, for which foundations will soon be laid. M. S. Mahurin, Cooper Building, Fort Wayne, Ind., is architect.

The Economy Governor Co., Anderson, Ind., has been organized to manufacture gas regulating equipment. A. L. Pickering is president.

Milwaukee

MILWAUKEE, Sept. 7.

IMPRESSIONS in the machine-tool trade are growing more favorable with an encouraging increase in inquiry and a sales volume that is believed to be gaining definitely, if rather slowly. Local foundries and machine shops which have bought little equipment for several months or longer are now inquiring for prices and nearest delivery dates. The city of Milwaukee, which is erecting a large municipal service shop for the concentration of all mechanical activities, is closing Sept. 10 on a motor-driven crank shaper, a lathe and a universal milling machine, and intends to make further purchases in the coming five to six months. The A. O. Smith Corporation is continuing relatively heavy purchases of miscellaneous shop equipment.

The Oilgear Co., Milwaukee, manufacturer of broaching machines and hydraulic machinery, has let the general contract to the Worden-Allen Co., for a brick and steel shop addition, 54 x 169 ft., two stories, which will cost about \$50,000 and will require an equal investment in new tools and equipment. The concern is enlarging its capital by \$250,000, using \$75,000 to purchase the plant at 655-659 Park Street, now occupied under lease, \$100,000 for new building and machinery, and adding \$75,000 to working capital. E. K. Swigart is president and general manager.

The Segal Co., 605-609 South Main Street, Oshkosh, Wis., which is building a large addition to its cold storage and wholesale produce warehouse, has placed the order for the conveyor equipment with the Standard Conveyor Co., St. Paul, Minn.

The Anaconda Copper Mining Co. has placed an order with the Allis-Chalmers Mfg. Co., Milwaukee, for rock crushing machinery and equipment, motors, etc., calling for an investment of approximately \$500,000. This is the third sizable order booked by the Allis-Chalmers company in recent weeks which aggregates \$2,250,000 in value.

The Kenosha, Wis., Board of Education is about to purchase the engines, boilers and other equipment required for the central power and heating plant of the new Central High School building, estimated to cost \$160,000. Miss Ella P. Powers is secretary of the board.

St. Louis

St. Louis, Sept. 7.

WORK will begin on a one-story and basement plant, 145 x 150 ft., at Kansas City, Mo., for the R. W. Yates Laundry Machine Co., 321 East Eleventh Street, C. B. Sloan, head, to cost approximately \$30,000, for which a general contract has been awarded to C. B. Mauns, Kansas City.

The Kingfisher Ice Co., Kingfisher, Okla., plans the installation of additional equipment at the plants of the Elk City Ice & Fuel Co., and the Citizens' Ice Plant, Elk City, Okla., recently acquired.

The Franke Motor Car Co., 1397 Hamilton Avenue, St. Louis, has plans for a two-story service, repair and garage building, 65 x 105 ft., to cost \$40,000. Otto J. Krieg, Arcade Building, is architect. John Connors is manager.

The Board of Education, Kansas City, Mo., plans the installation of manual training equipment in its proposed five-story and basement West Side junior high school, 71 x 185 ft., estimated to cost \$500,000, for which bids have been asked on a general contract. C. A. Smith, Finance Building, is architect.

The Columbian Steel Tank Co., West Twelfth Street, Kansas City, Mo., is reported to be arranging to begin work soon on the second unit of its plant, to cost more than \$150,000. Construction of the first unit is being completed. A. A. Kramer is head.

The Standard Oil Co., 314 North Jefferson Street, St. Louis, is asking bids for a group of three buildings, two for storage and distributing, and the other as a repair and garage building for company trucks and cars, estimated to cost \$45,000. Schlitz & Bailey, Monadnock Building, are architects.

The Tibbens Gasoline Co., Sapulpa, Okla., is said to be arranging for the early rebuilding of its natural gasoline refinery, recently destroyed by fire with loss of about \$100,000, including equipment.

The Southwestern Equipment Co., City Hall Building, El Reno, Okla., machinery dealer, has inquiries out for one 150-hp. fuel oil engine, Fairbanks-Morse or equal type, and one 37½-hp. crude oil engine.

The Hudson-Essex Motor Car Co., 457 St. Louis Street, Springfield, Mo., has plans for a new one-story and basement building, 75 x 179 ft., to cost about \$45,000. Hockenlively & Marx, Landers Building, are architects. Paul Oliver is manager.

The Talbot-Flood Mfg. Co., Dwight Building, Kansas City, Mo., has been organized to manufacture mortar mixing machinery and equipment. It plans to have manufacturing done by contract. O. C. Talbot is secretary and sales manager.

The Multi-Cut Rotary Bit Co., care of P. W. Smith, 315 Wirthman Building, Kansas City, Mo., has been organized to manufacture rotary drill bits for use in oil and water wells. Manufacturing will be done by contract.

New England

Boston, Sept. 7.

ALTHOUGH machine tools sales the past week were more numerous, business is far from active. A western Massachusetts shop has taken a 14 in. x 6 ft. lathe, a milling machine, a drill press, a medium sized planer and two other machines, used equipment, while other Massachusetts companies bought a used No. 3 Consolidated press, a six spindle drill, a hand miller, an upright drill and a small radial drill. The purchase of a 36-in. upright drill by the Boston & Maine Railroad was the most important sale of new equipment reported for the week. Two or three bench lathes figured in recent transactions.

Machine tool houses are encouraged by the showing of the past week in view of the fact that a large majority of purchasing agents have been out of town a week or longer. The feeling persists that general machinery business will pick up this month and by October possibly will be nearer a normal basis.

Small tools continue to sell freely. Among the most active buyers are manufacturers of refrigerating equipment, that industry being exceptionally busy. Railroad shops are the leading buyers, however. Sales the past week again included a good number of gages.

The Bath Iron Works, Bath, Me., will be sold at public auction Sept. 24. The court has made an upset price of \$90,000 on the property and equipment.

The Boston Ice Co., 110 State Street, Boston, has awarded contract for an ice making plant on Albany Street. C. Leslie Weir, 41 East Forty-second Street, New York, is the architect.

Plans will be ready soon for a proposed one-story, 60 x 125 ft. machine shop in the Charlestown district, Boston, to be erected by the school department. George S. McLaughlin, 80 Boylston Street, Boston, is the architect.

Refigured bids closed last Saturday for the plant of the Ford Motor Co. at Somerville, Mass., which will include a one-story, 301 x 1130 ft. assembly building, a one-story, 63 x 69 ft. power plant and an oil unit.

Gordon & Gerber, 20 Summer Street, Chelsea, rubber goods, contemplate the erection of a one-story, 60 x 150 ft. addition for which miscellaneous equipment is required. S. S. Eisenberg, 46 Cornhill, Boston, is the architect.

The Jackson Door & Window Co., 95 Canal Street, Boston, will erect a two-story addition to its plant at Everett, Mass., to cost approximately \$45,000. The Warren Engineering Corporation, 50 Terminal Street, Charleston, Mass., is engineer.

Reorganization plans have been completed for the New Home Sewing Machine Co., Orange, Mass., and a new company headed by W. L. Desnoyers has been formed to take over the property which has been acquired from Charles N. Stoddard, receiver. It is proposed to finance for plant betterments and enlarged production. F. J. Kelley, acting general manager under the receivership, will continue as general manager of the new company.

The Remington Typewriter Co., 374 Broadway, New York, is planning for a three-story addition to its works at Bridgeport, Conn., to cost \$50,000 with equipment.

The Board of City Trustees, Shrewsbury, Mass., plans the installation of pumping equipment in connection with proposed extensions and improvements in the municipal waterworks, to cost \$40,000.

The Fafnir Bearing Co., Booth Street, New Britain, Conn., manufacturer of ball bearings, etc., has awarded a contract to the Aberthaw Construction Co., Boston, for its six-story addition, 60 x 165 ft., to cost \$200,000 with equipment.

The New England Confectionery Co., 253 Summer Street, Boston, will proceed with the construction of a power house, 46 x 112 ft., at its proposed six-story and basement factory, 175 x 350 ft., Cambridge, Mass., to cost close to \$250,000. Lockwood, Greene & Co., 24 Federal Street, Boston, are engineers.

Pittsburgh

PITTSBURGH, Sept. 7.

THERE is little activity in the local machine tool business, sales running chiefly to replacement needs which reach a fairly good total. The Westinghouse Electric & Mfg. Co. is closing against its quarterly list as requirements arise. The Pennsylvania Railroad has bought a few tools for its local shops. Pending or prospective business is large, but buyers are slow in closing.

The National Radiator Co. has given Smith & Bauman, New Castle, Pa., contract for the construction of a new boiler foundry as an addition to its plant at New Castle.

The Lukens Steel Co., Coatesville, Pa., is inquiring for a small Guillotine shear, capacity 1½ x 36 in. thick, soft steel.

Frank D. Saupp, Inc., 5928 Penn Avenue, Pittsburgh, automobiles, will soon take bids for a two-story service, repair and garage building, 106 x 150 ft., to cost approximately \$125,000 with equipment. The Fisher-Wood Co., Hardy-Hays Building, is architect.

Fire, Aug. 30, destroyed the tippie at the Meadow Brook mine of the Consolidation Coal Co., Clarksburg, W. Va., with loss estimated at \$35,000 including equipment. It is planned to rebuild. Headquarters are in the Continental Building, Baltimore.

The American Car & Foundry Co., Twenty-third Street and Third Avenue, Huntington, W. Va., is said to be planning for the early rebuilding of the one-story shop recently destroyed by fire with loss approximately \$25,000.

The Board of Education, Johnstown, Pa., plans the installation of manual training equipment in its proposed four-story and basement Garfield junior high, estimated to cost \$700,000, for which bids will be asked in the near future. J. E. Adams, Nemo Building, is architect.

Elevating, conveying and other equipment, including factory trucks, will be installed in the proposed five-story and basement warehouse and distributing plant, 100 x 335 ft., to be erected by the H. J. Heinz Co., 1062 Progress Street, Pittsburgh, to cost \$1,200,000. Albert Kahn, Inc., Marquette Building, Detroit, is architect.

Meanor & Handloser, Huntington, W. Va., architects, will ask bids early in October for a five-story automobile service, repair and garage building, 170 x 185 ft., to cost \$180,000 with equipment.

The National Biscuit Co., Pennsylvania Avenue and Lambert Street, Pittsburgh, has awarded a general contract to D. T. Riddle, 1006 Forbes Street, for a three-story and basement addition to its service, repair and garage building, to cost about \$125,000 with equipment.

John Zimmerman, R. F. D. No. 8, Box 1, Butler, Pa., has inquiries out for rivets, nails, hinges and other iron and steel products.

Cincinnati

CINCINNATI, Sept. 7.

THE Dayton Engineering Laboratories Co., Dayton, Ohio, placed an order for 16 shaft lathes with a local builder the past week. Railroad buying is limited, but considerable business is pending. The Illinois Central purchased several lathes in this market. It is reported that the Louisville & Nashville will close shortly for a number of lathes. A New York elevator company ordered three boring mills from a local machine tool company, while the Carnegie Steel Co. is the buyer of a boring mill. Sales of automatic lathes to Michigan automobile manufacturers has increased in the past two weeks. Local machine tool builders believe that sales will increase greatly in the latter part of September.

Planer manufacturers have experienced a lull in sales, but inquiries are brisk. Orders for shapers have decreased. The John Steptoe Co. booked a 20-in. shaper for Indianapolis delivery and a similar machine for shipment to New York. Demand for upright and radial drills is holding up fairly well, especially from the automotive industry. Production of milling machines has tapered off slightly. The Big Four Railroad is in the market for a boring mill.

Manual training equipment will be installed in the Everett junior high school, Columbus, Ohio. E. L. McCune, 270 East State Street, Columbus, is secretary of the Board of Education.

The Superior Castings Co., Perry Avenue and River Street, Dayton, Ohio, has placed a general contract with the Dayton Structural Steel Co. for a one-story factory, 40 x 100 ft. John Hocky is president.

The Delco Light Co., Dayton, Ohio, has taken over the buildings formerly occupied by the General Motors Research Corporation and the Dayton Wright Co. at Moraine City, Ohio, a few miles south of Dayton. Processing equipment, such as enameling ovens, porcelain ovens, machinery to handle sheet metal, and other equipment, is being installed at a cost of \$1,000,000. The equipment has been largely contracted for. The factory buildings will be operated as plant number two. The company is also expanding its main plant facilities to double the present output and will expend \$1,000,000. A considerable part of this amount will be used in purchasing machinery, conveyors and enameling ovens.

Contract has been let by the Higgins Mfg. Co., Newport, Ky., manufacturer of hardware specialties, to J. K. Mays & Sons, Fort Thomas, Ky., for a two-story addition, 66 x 89 ft. L. H. Wilson, 10 West Fourth Street, is architect.

The City Ice & Fuel Co., Cincinnati, has plans for a one-story pipe shop on Mathers Street.

The Baker Car Co., Harriman, Tenn., is said to have closed negotiations for the purchase of the plant of the William J. Oliver Mfg. Co., Knoxville, Tenn., manufacturer of agricultural implements, etc., and will remodel for the manufacture of mining machinery, mining cars, etc.

The Board of Regents, Frankfort, Ky., college at Morehead, Ky., has completed plans for a three-story power house at the institution, 85 x 200 ft., estimated to cost \$150,000 with equipment. Joseph & Joseph, Francis Building, Louisville, are architects.

The L. J. Breed Equipment Co., James Building, Chattanooga, Tenn., is in the market for a 35-ton locomotive, standard gage.

The Southern Engine & Boiler Co., Jackson, Tenn., recently reorganized, is considering plans for extensions for

the production of additional lines of equipment. Hubert C. Edwards is general manager.

The Standard Gas & Electric Co., Chicago, has announced plans for construction of a \$10,750,000 water power plant in the Ohio river at Louisville, Ky. The project, which is to be carried out in cooperation with the Federal Government, calls for a plant in 13 units with an initial capacity of 108,000-hp., with provision for an ultimate capacity of 135,000-hp. The power house will be constructed by the Byllesby Engineering Corporation. A two-mile dam, to be built by the Federal Government, will be the central unit in the power project. The new system, when completed, will be operated by the Louisville Hydro-Electric Co., recently licensed by the Federal Power Commission. Construction work will be started immediately.

South Atlantic States

BALTIMORE, Sept. 7.

PLANS are being completed by Stehl & Michael, 100 North Liberty Street, Baltimore, engineers, for a one-story mill for the Kimball-Tyler Co., Inc., cooperage products, estimated to cost \$200,000 with machinery. It will replace a plant recently destroyed by fire. W. G. Tyler is president.

Fire, Sept. 1, destroyed a portion of the four-story factory of C. J. Taylor & Co., 201-3 West Camden Street, Baltimore, manufacturer of paper boxes and containers. It is planned to rebuild.

The Linde Air Products Co., 30 East Forty-second Street, New York, has awarded a general contract to J. P. Pettyjohn & Co., 212 Eighth Street, Lynchburg, Va., for a one-story branch plant at Roanoke, Va., to cost \$25,000.

The Board of Aldermen and Utilities Commission, Elizabeth City, N. C., are asking bids until Sept. 23 for motor-driven pumping machinery and accessory equipment for proposed extensions and improvements in the municipal sewage system. William C. Olsen, Raleigh, N. C., is consulting engineer.

The Balfour Mills, Hendersonville, N. C., will begin the construction of a steam-operated electric power plant at their local textile mills, to cost \$50,000 with equipment.

The Southwest Supply Co., 213 Glenn Building, Atlanta, Ga., is considering the establishment of a plant for the manufacture of corrugated culvert pipe. Inquiries are out for necessary machinery.

The Norfolk & Western Railway Co., Roanoke, Va., is said to be planning the installation of a water-softening plant at its terminal at Richlands, W. Va.

W. M. Linker, Concord, N. C., and associates have acquired about 12 acres and have preliminary plans for a new furniture factory, with power house, to manufacture particularly chairs and tables, reported to cost \$80,000 with machinery.

The Hackley Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for two 250-kw. turbo-generators, 440 volts, three-phase, 60 cycles, complete with exciter, switchboard, condenser and auxiliary apparatus; also one steel tank and tower, about 70,000 gal. capacity.

The W. N. McAuge Co., Suffolk, Va., is in the market for a fertilizer-mixing machine, to operate either with steam or gasoline engine.

The Board of Education, Petersburg, Va., plans the installation of manual training equipment in a proposed junior high school in the Peabody district, estimated to cost \$300,000. The Charles M. Robinson Co., Times-Dispatch Building is architect.

The Cochrane Sales Co., 135 West North Avenue, Baltimore, automobiles, has awarded a general contract to W. G. Gishel & Sons, local, for a two-story automobile service, repair and garage building, 60 x 215 ft., to cost \$85,000 with equipment.

B. H. Taylor, Alcolu, S. C., is desirous of getting in touch with manufacturers of small metal stampings and small brass castings, with view to contracting for a quantity of combination switch locks for automobile service.

The City Commission, Rock Hill, S. C., plans the installation of additional pumping machinery to provide for an additional water supply from the Catawba River of about 250,000 gal. per day. W. P. Goodman is city manager.

Gulf States

BIRMINGHAM, Sept. 7.

PLANS are under way by the Pure Process Ice Makers, Inc., Tuscaloosa, Ala., for a new plant, 50 x 150 ft., to cost \$50,000, of which about \$35,000 will be used for equipment. A. F. Norton is general manager.

The Southern Fountain & Fixture Co., Dallas, Tex., has

work under way on a three-story plant at 1900-6 Cedar Springs Road, totaling about 40,000 sq. ft., estimated to cost \$50,000.

A. F. Haeussler, P. O. Box 581, Coral Gables, Fla., contemplates equipping a local plant for the manufacture of concrete blocks, and is in the market for mixing, molding and other equipment.

The Middle West Utilities Co., Frost Building, San Antonio, Tex., has tentative plans for a new electric power house at Gonzales, Tex. An ice-manufacturing plant will also be built. It is also planning the construction of an ice-manufacturing plant at Kingsville, Tex. M. J. Mozart is engineer.

The Western Agricultural Chemical Co., Mexia, Tex., will build a two-story fertilizer plant to cost about \$50,000 including machinery.

Ralph H. Cameron, City National Bank Building, San Antonio, has plans for a two-story automobile service, repair and garage building, with foundations for three additional floors later, estimated to cost \$75,000.

The City Council, Tarpon Springs, Fla., plans the installation of a pumping plant in connection with a proposed municipal waterworks, for which bonds for \$400,000 have been approved. C. E. Burleson, Clearwater, Fla., is engineer.

The M. A. Fuller Cotton Oil Co., Snyder, Tex., has plans for a new two-story mill at Lamesa, Tex., to cost about \$125,000 with machinery.

The Board of Trustees, Tavares School District, Tavares, Fla., plans the installation of manual training equipment in its proposed two-story high school, estimated to cost \$150,000. Lockwood & Poundstone, Forsyth Building, Atlanta, Ga., are architects.

The Birmingham Electric Co., 109 North Eleventh Street, Birmingham, has plans for a one-story foundry and shop to cost approximately \$20,000.

The Aetna Iron & Steel Co., Jacksonville, Fla., has inquiries out for a combination plate and angle shear to handle $\frac{1}{2}$ -in. stock; a punch for holes $\frac{3}{4}$ -in. diameter through $\frac{3}{4}$ -in. stock; metal racks for holding bars and angles, and other kindred equipment.

Pacific Coast

SAN FRANCISCO, Sept. 2.

PLANS are being completed by the Pacific Spring Co., Fruitvale, Cal., for a new two-story plant, for the manufacture of steel springs, etc., to cost \$50,000 with equipment. James W. Plachek, 2014 Shattuck Avenue, Berkeley, Cal., is architect in charge.

The Taylor Motors, Inc., Stockton, Cal., will soon begin the construction of a one-story automobile manufacturing plant, 75 x 150 ft., to cost about \$50,000. Initial operations are expected to be devoted largely to assembling.

The Union Ice Co., Escondido, Cal., is arranging for a one-story ice-manufacturing plant, to cost \$40,000 with equipment.

The Union Oil Co., Los Angeles, is completing plans for a new gasoline refinery at Fort Collins, Colo., including a compressor works for extraction, estimated to cost \$450,000 with equipment.

Fire, Aug. 23, destroyed a portion of the plant of the Arthur Aves Cabinet Co., Ninth Avenue and West A Street, Yakima, Wash., with loss estimated at \$50,000 including equipment. It is planned to rebuild.

The Schumacher Wall Board Co., Los Angeles, is contemplating a new unit at its plant at 6851 East Marginal Way, Seattle, Wash., reported to cost \$300,000 with machinery. John Schumacher, Sr., is president.

The Shell Oil Co., Los Angeles, will begin the construction of a new distributing and storage plant at Tucson, Ariz., including pumping station, estimated to cost \$30,000.

The Los Angeles Paper & Mfg. Co., Los Angeles, has awarded contract to Charles B. Harp, Chamber of Commerce Building, for a one-story mill on the Valley Boulevard, 50 x 330 ft., for which plans were prepared by Noice & Merrill, Washington Building, engineers.

The City Council, Mesa, Ariz., is asking bids until Sept. 21 for municipal electric lighting equipment, including one 1000-kw. frequency changer set, switchboard apparatus, etc. The Weiland Engineering Co., Thatcher Building, Pueblo, Colo., is engineer.

The Board of City Trustees, Riverside, Cal., plans the installation of pumping machinery in connection with proposed extensions in the municipal waterworks, estimated to cost \$500,000. A bond issue is being arranged.

The Board of Education, Los Angeles, will build a one-

story manual training school, 63 x 169 ft., at its proposed Thomas Starr King junior high school estimated to cost \$350,000. Roland E. Coate, Union Bank Building, is architect.

The McCormick Lumber Co., San Francisco, is reported to have plans for a new sawmill and lumber mill at Port Ludlow, Wash., vicinity of Seattle, to cost about \$1,000,000 with machinery. A power house and machine shop will be erected. Charles R. McCormick is president.

The Southern Pacific Railroad Co., 65 Market Street, San Francisco, has acquired 80 acres at Lake Ewauna, Klamath Falls, Ore., and is said to have preliminary plans under way for new shops and terminal at this location, to cost \$300,000.

Canada

TORONTO, Ont., Sept. 7.

THE showing of machine tools and machinery at the Canadian National Exhibition, Toronto, during the past week, has had a stimulating effect on sales, especially in such lines as specialize in high production as well as labor and time saving. Buyers have been showing keen interest in exhibits here and the opportunity to see tools in operation has influenced many to place orders. Generally speaking, the machine tool market has been satisfactory for some time past and dealers and builders have closed a greater volume of sales so far this year than they did in the corresponding period a year ago. Buying has been confined chiefly to single tools but there is a feeling that some good lists will appear within the next month or six weeks. Small tools are moving in a steady manner but buying is chiefly for immediate needs. Prices are showing little fluctuation.

The Hoyt Metal Co., has completed the erection of its new factory building on Eastern Avenue, Toronto, and has started installing machinery. G. F. Allen is vice-president.

The Temiskaming & Northern Ontario Railroad has awarded contract to Angus & Taylor for the construction of power house at North Bay, Ont. The contract is for the building alone which will cost \$22,000. Equipment and machinery will be awarded later.

The Quebec Street Railway, Quebec, Que., has purchased a site in Limoulin, where it will erect a workshop and install equipment for the repair of its cars.

The machinery storehouse of the International Nickel Co., Copper Cliff, Ont., was destroyed by fire with loss to building and contents of \$150,000.

The engineering staff of the Kingdon Mining, Smelting & Mfg. Co., 314 Beaver Hall Hill, Montreal, is preparing plans for lead and zinc plants at Kingdon, Que., to cost \$1,500,000.

Two additional reinforced concrete buildings are to be added to the paper plant of the Powell River Co., Powell River, B. C. The new buildings will represent an expenditure of \$400,000.

Officials of the B. Greening Wire Co., Hamilton, Ont., have acquired Canadian and British rights from the Hoff Metal Products Co., New York, to manufacture automobile chains. This involves immediate extension of the company's plant and the expenditure of about \$75,000 for special machinery.

W. R. Wilson, president and managing director of the Crow's Nest Pass Coal Co., has interested British capitalists in a project to establish a small iron and steel plant at Fernie, B. C., to use coal from Crow's Nest Pass, and hematite from Iron Mountain, which is 10 miles east of Creston, on the Canadian Pacific. As a preliminary towards this project, the group of claims owned by C. P. Hill and associates will be thoroughly explored by diamond drilling. What promises to be extensive deposits of high grade hematite, low in phosphorus, have been uncovered at several points.

The Union Oil Co. of California proposes to build a large storage and distributing plant at Edmonton, Alta., next spring. The proposed undertaking includes the erection of a steam plant and a number of large buildings and tanks. The initial outlay will be approximately \$50,000.

Construction work has started on the new factory at Vancouver, B. C., for the American Co., Ltd. The estimated cost of the group of three buildings is \$475,000, and when the proposed can-making machinery is installed the cost of the plant will be well over \$1,000,000.

S. E. O'Brien, secretary for the Dominion Department of Public Works, Ottawa, Ont., is receiving bids for 10 air compressors for a drydock at Esquimalt, B. C.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

THE following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general headings of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates		Per Lb.
Bars:		
Refined iron bars, base price	.....	3.24c.
Swedish charcoal iron bars, base	.....	7.00c. to 7.25c.
Soft steel bars, base price	.....	3.24c.
Hoops, base price	.....	4.49c.
Bands, base price	.....	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	.....	3.34c.
Channels, angles and tees under 3 in. x ¼ in. base	.....	3.24c.
Steel plates, ¼ in. and heavier	.....	3.34c.

Merchant Steel		Per Lb.
Tire, 1½ x ½ in. and larger	.....	3.30c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	.....	3.65c.
Toe-calk, ½ x ¾ in. and larger	.....	4.20c.
Cold-rolled strip, soft and quarter hard	.....	7.00c.
Open-hearth spring steel	.....	4.50c. to 7.00c.
Shafting and Screw Stock:		
Rounds and hex	.....	4.00c.
Squares and flats	.....	4.50c.
Standard tool steel, base price	.....	15.00c.
Extra tool steel	.....	18.00c.
Special tool steel	.....	23.00c.
High-speed steel, 18 per cent tungsten	.....	70c.

Sheets		Per Lb.
Blue Annealed		
No. 10	.....	3.89c.
No. 12	.....	3.94c.
No. 14	.....	3.99c.
No. 16	.....	4.09c.

Box Annealed—Black		Per Lb.
Soft Steel C. R. One Pass		Per Lb.
Nos. 18 to 20	.....	3.70c. to 3.95c.
Nos. 22 and 24	.....	3.75c. to 4.20c.
No. 26	.....	3.80c. to 4.25c.
No. 28*	.....	3.90c. to 4.35c.
No. 30	.....	4.10c. to 4.55c.

Galvanized		Per Lb.
No. 14	.....	4.00c. to 4.35c.
No. 16	.....	4.15c. to 4.50c.
Nos. 18 and 20	.....	4.30c. to 4.65c.
Nos. 22 and 24	.....	4.45c. to 4.80c.
No. 26	.....	4.50c. to 4.95c.
No. 28*	.....	4.90c. to 5.25c.
No. 30	.....	5.40c. to 5.75c.

*No. 28 lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe			
Standard Steel		Wrought Iron	
Black	Galv.	Black	Galv.
½ in. Butt....	46 29	½ in. Butt....	4 +19
¾ in. Butt....	51 37	¾ in. Butt....	11 + 9
1-3 in. Butt....	53 39	1-1½ in. Butt.	14 + 6
2½-6 in. Lap..	48 35	2-in. Lap....	5 +14
7 & 8 in. Lap..	44 17	3-6 in. Lap..	11 + 6
11 & 12 in. Lap.	37 12	7-12 in. Lap.	3 +16

Bolts and Screws	
Machine bolts, cut thread, 40 and 10 per cent off list	
Carriage bolts, cut thread, 30 and 10 per cent off list	
Coach screws, 40 and 10 per cent off list	
Wood screws, flat head iron,	
72½, 25, 10 and 5 per cent off list	

Steel Wire		Per Lb.
BASE, PRICE† ON NO. 9 GAGE AND COARSER		
Bright, basic	.....	4.25c.
Annealed, soft	.....	4.50c.
Galvanized, annealed	.....	5.15c.
Coppered, basic	.....	5.15c.
Tinned, soft Bessemer	.....	6.15c.

†Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire	
BASE PRICE	
High brass sheet	.....19½c. to 20½c.
High brass wire	.....19½c. to 20½c.
Brass rods	.....16½c. to 17½c.
Brass tube, brazed	.....27½c. to 28½c.
Brass tube, seamless	.....23½c. to 24½c.
Copper tube, seamless	.....24½c. to 25½c.

Copper Sheets	
Sheet copper, hot rolled, 22½c. to 23½c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates			
Bright Tin		Coke—14x20	
Grade "AAA"	Grade "A"	80 lb...	Prime Seconds
Charcoal 14x20	Charcoal 14x20	90 lb... 6.30	6.05
IC.. \$11.25	\$8.85	100 lb... 6.45	6.20
IX.. 12.85	10.85	IC.. 6.65	6.40
IXX.. 14.40	12.55	IX.. 7.85	7.60
IXXX.. 15.75	13.85	IXX.. 9.00	8.75
IXXXX.. 17.00	15.05	IXXX.. 10.35	10.10
		IXXXX.. 11.35	11.10

Terne Plates	
8 lb. coating, 14 x 20	
100 lb.	.....\$7.00 to \$8.00
IC	.....7.25 to 8.25
IX	.....8.25 to 8.75
Fire-door stock	.....9.00 to 10.00

Tin	
Straits, pig	.....60c.
Bar	.....65c. to 67c.

Copper	
Lake ingot	.....16½c.
Electrolytic	.....16½c.
Casting	.....16 c.

Spelter and Sheet Zinc	
Western spelter	.....9½c.
Sheet zinc, No. 9 base, casks	.....12½c., open 13c.

Lead and Solder*	
American pig lead	.....11c. to 13½c.
Bar lead	.....13c. to 14c.
Solder, ½ and ½ guaranteed	.....40c.
No. 1 solder	.....37c.
Refined solder	.....30½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal	
Best grade, per lb.	.....75c. to 90c.
Commercial grade, per lb.	.....35c. to 50c.
Grade D, per lb.	.....25c. to 35c.

Antimony	
Asiatic	.....20c. to 21c.

Aluminum	
No. 1 aluminum (guaranteed over 99 per cent pure), ingots for remelting, per lb.	.....31c. to 34c.

Old Metals	
Business is quiet and prices are generally unchanged. Dealers' buying prices are as follows:	

	Cents Per Lb.
Copper, heavy crucible	.....12.00
Copper, heavy wire	.....11.75
Copper, light bottoms	.....9.50
Brass, heavy	.....7.25
Brass, light	.....6.00
Heavy machine composition	.....9.00
No. 1 yellow brass turnings	.....8.50
No. 1 red brass or composition turnings	.....8.25
Lead, heavy	.....8.25
Lead, tea	.....6.75
Zinc	.....4.50
Cast aluminum	.....17.50
Sheet aluminum	.....17.50

